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Papers presented at a working conference on new developments in measuring financial conditions of colleges and universities included the following: "Using Financial Indicators for Public Policy Purposes," by George W. Bonham; "Conceptual Advances in Specifying Financial Indicators: Cash Flows in the Short and Long Run," by Hans H. Jenny; "Another Approach to Institutional Classification," by Kent Weldon; "The Financial Community's Use of Indicators," by John Berenyi; "Accounting Practice and Its Implications for Financial Analysis," by William Wilkinson; "A Model of University Finances Providing for Planning Trade-offs," by Nathan Dickmeyer; "Applications of Statistics to Indicator Development," by A. Jackson Stenner; and "Designing a Research Program to Accelerate Indicator Development," by D. F. Finn. The agenda and roster of participants in the conference are also included. (SC)

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FINANCIAL MEASURES PROJECT

NEW DEVELOPMENTS IN MEASURING FINANCIAL CONDITIONS OF COLLEGES AND UNIVERSITIES:

PAPERS PRESENTED AT A WORKING CONFERENCE

ANNAPOLIS, MARYLAND
OCTOBER 20-21,1977

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NEW DEVELOPMENTS IN MEASURING FINANCIAL CONDITIONS OF COLLEGES AND UNIVERSITIES: A COMPILATION OF PAPERS FROM A CONFERENCE

held October 20-21, 1977
Annapolis, Maryland

Sponsored by the

Economics and Finance Unit of the
American Council on Education

and the

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Business Officers

and the

National Center for Education Statistics

Washington, D. C.

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New Developments in Measuring Financial Conditions
of Colleges and Universities

October 20-21, 1977
Annapolis, Maryland

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New Developments in Measuring Financial Conditions
of Colleges and Universities

October 20-21, 1977
Annapolis, Maryland

AGENDA

Thursday, October 20

Morning	Purposes of the Working Conference	Carol Van Alstyne American Council on Education
		Mary Golladay National Center for Education Statistics
	Report on the NCES/ACE Financial Ratios Project	Paul Mertins National Center for Education Statistics
	"What can we do with existing data?"	Sharon L. Coldren, ACE Paula Knepper, ACE
	Application of Statistics to Indicator Development	A. Jackson Stenner National Testing Service
Afternoon	Conceptual Advances in Specifying Financial Indicators	
	1. Cash Flow Analysis	Hans H. Jenny College of Wooster
	2. Balance Sheet Analysis	W. John Minter John Minter Associates

Friday, October 21

Morning	Use of Indicators for Public Policy Purposes	George Bonham *Change* Magazine
	Use of Indicators by the Financial Community	John Berenyi First National City Bank
	Classifying Institutions for Financial Analysis	Jim Topping Doug Collier Kent Weldon NCHEMS
	Developments in Non-profit Accounting Relating to Financial Indicators	William Wilkinson University of Rochester
Afternoon	Developments in Computerized Financial Modeling Relating to Financial Indicators	Nathan Dickmeyer Stanford University
	Analytic Gaps to be Filled	Andrew Lupton Academy for Educational Development
		William Shoemaker Council for the Advancement of Small Colleges
	Design of a Research Program to Accelerate Indicator Development and Application	D. F. Finn National Association of College and University Business Officers
		Carol Van Alstyne American Council on Education

USING FINANCIAL INDICATORS FOR PUBLIC POLICY PURPOSES

George W. Bonham
Editor-in-Chief, Change Magazine

I have only recently discovered why it is that academics are so excessively fond of quoting passages out of Alice in Wonderland. Their fondness for Alice derives from their close familiarity with her terrain. It is indeed true that, in education, the more things change, the more things are the same. Lewis Carroll could have had a good deal of fun in this academic Land of Oz, though for most of us that fun has long since dissipated, replaced by boredom over the certain tediousness of themes that runs through much of the academic enterprise with cyclical regularity.

I was reminded again of the academic affection for Alice in Wonderland while thinking through the task of economists and financial analysts, who now concern themselves with the financial undergirdings of academic enterprises. Academics are fond of saying that their central social function is the pursuit of truth, and yet, I believe, they might prefer to exempt financial truths from this generalization. Academics are also fond of reminding us that they serve the public interest, and yet, there are times when I suspect that they confuse the public interest with their own more parochial welfare. Many academics have said--and with some justification--that financial measurements remain at such a primitive level that not much attention should be paid to them. And yet, I submit, once such measurements become more sophisticated (as they are about to become), many academics will say that these analytic tools ought not to be used because they will lead to conclusions that may be dangerous to the health of academics.

There is enough truth on all sides to take a closer look at the stakes involved. I would counsel that we mix technical caution with political courage. Neither has been in as much evidence as I should like to see.

The Social Picture

Let me begin with this larger social observation: We have now arrived at the point in this country where about 35 percent of our labor force is employed in the nonprofit sector, 1/ and about an equal percentage of our gross national product is also generated in that sector. As there is no price market in the nonprofit

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1/ Including all levels of government.

segment of the economy, there is no effective way for us to value the measure of services produced in this sector. And the pressure to increase such nonprofit services is not directly matched by the mechanisms to pay for them -- a situation which translates into either a rising debt or rising taxes. What then emerges is a new field of what Schumpeter has called "fiscal sociology."

One of our dilemmas arises from the imbalance between the production sectors (such as industry and technology) and human and governmental services, as these involve productivity, wage increases, unit costs, and inflation. The differences of productivity and inflationary costs become clear, if, for instance, we compare the costs of higher education with those of General Motors. If auto workers receive a 10 percent wage increase, the unit cost increase will be 3 percent, since labor costs in that industry make up 30 percent of unit production. Indeed, the cost of such a wage increase can probably be easily absorbed. But if faculty and other academic professionals receive a 10 percent wage increase, the pass-along cost becomes 7 percent, because education is a highly labor-intensive service field. If productivity in academic enterprises increases, say, by 2 percent, there remains a 5 percent inflationary gap, which, if continued over the course of a decade, becomes a matter of serious public concern and represents a central ingredient for public attention. These increases are particularly real in a nonprofit field such as higher education, where constantly rising public entitlements force ever further and upward the public demand for high-cost educational services.

This general crisis of rapidly growing social expenditures occurs not only in higher education, of course, but reflects broader patterns of public services in America. One of the new and more curious narcissims of academic leaders is that they wish to justify academic expenditures for their own sake, and in virtual isolation from the even-more-rapidly-growing public demands for other social and welfare services. One should not be surprised that the federal government now wants to put a lid on price rises in health services. These efforts at capping costs will inevitably spill over into the academic field. While I do not wish to be unkind to the academic profession, which, God knows, is already under enough public scrutiny, I must say that it is rapidly learning the art of stonewalling: dealing with the present as best it can and letting the future take care of itself. I am not convinced that this is enough.

Having expressed this general social philosophy--that academic life cannot long remain exempt from reasonable efforts to measure its own performances--I hasten to say at once that just what is measured, and how, remains enormously difficult. What usually happens is that we measure what is measurable and believe that this set of data

represents a comprehensive hologram, if you will, of academic performance. Unhappily, the real and significant academic outputs are learning outputs, as measured in the wisdom and coping abilities of students. Here our best measurement efforts remain at the Stone-Age level.

Unsophisticated Academics

There was a time, not so many years ago, when the academic enterprise was excessively enamored of the new age of managerialism. According to this school of thought, an institution's only requirements were a sufficient array of management information systems, data-processing equipment, and an impressive computer capability; sufficiently sophisticated software would inevitably follow, and Nirvana was just around the corner. What was around the corner was Mickey Mouse, at least in part. I only wish that the management technicians had been a little more humble about their promised land. What we got, instead, was a predictable rash of suspicions by the academic leadership. What they saw in these new management tools was 50 percent hocus-pocus and 50 percent usable information.

I am more optimistic today about the sense of responsibility that is being shown on all sides. Some serious efforts at cost analysis are under way, including the Bowen-Minter studies, the efforts of NCHEMS, the new coordinating efforts of the American Council on Education, and, more recent still, the work of the Education Commission of the States.

Contrary to common sense, however, the more successful the technical developments, the more political resistance is likely to come from those responsible for what is being measured. Data compilation and analysis, after all, constitute the modern equivalents of power, and power can be used or abused, depending on one's motivations. Despite the traditional and sometimes warranted suspicion of their undue interference, the federal government--and especially the National Center for Education Statistics--will be loathe to take on any initiatives in this area of financial analysis, for the very reason that suspicions of federal dominance are widely imbued in our democratic traditions. The voluntary efforts that are now being pursued reach more limited--and occasionally, more partisan--objectives. It is my hope that wiser heads will ultimately prevail and that all the research efforts now going forward may in time find some common terminus that will serve higher education as a single economic and human service entity.

In my travels around the country, I am often surprised at the economic ignorance of academic professionals, who should know more

about their own campuses. Even the most basic economic data, such as annual income from endowment or ratio of acceptances to applications for admission, are often unknown to even the senior officers of a college. How this can be so in 1977 is a puzzlement to me. This lack of economic sophistication is of course even more pronounced among faculty, and thus one compounds weakness upon weakness. It was for this reason that Change brought together a national panel of leading economists some years ago. Out of their work came a primer on economics, which as of now has been ordered by over 25,000 academics. We intend to do further work along this line in the future.

Danger Points

I want to discuss briefly some of the political aspects of financial analyses of academic institutions. Several major danger points make this entire process politically hazardous, and I think we must eventually deal with each of them. The arguments against national cost analysis go something like this:

- No one in public office wants to have the awful responsibility of deciding which institutions deserve to survive and which deserve to fade away. Available data, if sufficiently sophisticated, may in fact force such political decisions.

- Trend data could be politically appealing if they showed a net erosion of academic vitality but could be damaging to institutions if cost trends were shown to be on the up side.

- Comprehensive national data and sound fiscal analyses may advance the argument for national unit cost data, which few people would consider a wise step, including myself.

- If data showed that institutions were above-average in financial and academic health, a period of benign neglect, if you will, might begin. In other words, these data could very well serve those below average financially but be detrimental to the more affluent, in arguing for public and philanthropic support.

- Quantitative fiscal data may easily be used as qualitative performance information about an educational institution, and the two are obviously not the same.

- Finally, it could be argued that national data analysis could further homogenize our system of higher education, eliminating the weak and the strong, with everything tending toward the center, which some would regard as tending toward the mediocre.

These are at least some of the major legitimate arguments that can be made against the fuller construction of national cost data. But my own sense of what is possible and of what will be politically necessary, differ considerably from these arguments.

Arguments Favoring More Research

Let me advance the following reasoning which I think may support the view that further and much more sophisticated work in this area will become necessary:

- To ask the economic questions about an academic enterprise is ultimately to ask the value questions as well: For example, how much does humanities instruction cost us, and is this enough or too much in relation to everything else and in relation to what we want to be?

- As a matter of self-interest, institutions need to know how, and in what aspects, they compare in structure and performance with peer institutions. To know this is a spur to action and improvement.

- Cost data may not in fact lead to a leveling of institutions but rather may reinforce institutions in their uniqueness in order to justify their cost differentials. Students at Harvard, Stanford, or Dartmouth and out-of-state students at Michigan or Berkeley pay the higher increments, and often gladly. They may be buying a felt reputation as much as a superior education. The market still operates. The same, of course, applies to entire state systems.

- Economic self-knowledge by academic institutions is far preferable to the accountability demand for cost analyses by public agencies. The latter is more than likely in the decades ahead, and indeed is already occurring, particularly on the part of state governments.

- In a period of general decline, the management of that decline requires the most detailed knowledge of that down-side terrain. To make value judgements about the options open in that period requires specific self-knowledge, which is now hardly available.

I cannot say just where the academic enterprise will come out on these issues. If we regard past history as our most reliable instructor, it is likely that a much greater analytic competence on the part of academic institutions will be forced on them by external pressures, rather than having it develop out of their own sense of public responsibility. Whichever happens, the analysts at this conference can rest assured that their developmental work will not have been wasted. They will not necessarily be loved for their work, or even listened to. But as long as the analysts perform these functions with discretion and a minimum of messianic fervor, with impeccable analytic honesty and a constant attention to the essential function of academic life--which is the improvement of the human race--I have no doubt that they will be performing an important public service. The foundation of any liberal society, says Daniel Bell, is the willingness of all groups to compromise private ends for public interest. The people at this conference serve that public interest, and I wish them well in these important endeavors.

CONCEPTUAL ADVANCES IN SPECIFYING FINANCIAL INDICATORS: CASH FLOWS IN THE SHORT AND LONG RUN

Hans H. Jenny
The College of Wooster

The Financial Measures Project is an important undertaking not only to the growing number of specialists who are devoting their professional energies to the ways, means, and pitfalls of divining the ever-changing financial conditions of higher education institutions, but also to knowledgeable policy-makers in government, in foundations, and, yes, even in colleges and universities.

Financial Measures: Some Pitfalls

Economists are not trusted by everyone. When economists come upon the higher education scene purporting to measure the "institutional conditions," others rightly remember that old injunction "caveat emptor."

When we sell "indicators," financial and otherwise, what nostrums are we peddling?

My trusty Random House Dictionary of the English Language defines an indicator as "an instrument for measuring and recording variations" of something.

To date, most of our attempts have been to measure changes that occur in a set of more or less interdependent variables; most of the time we are not sure just how these variables fit together. Most striking, we have as yet no well formulated or generally accepted consensus on what is meant by "institutional health" or by "financial health."

I hope that I am not overstating the case. But if I am overstating it, how far from the truth is my assertion?

Reviewing the literature on the financial condition of higher educational institutions, I discern some common elements that would seem to belie my statement. From the Sixty-College Study of the 1950s through the Carnegie Commission studies of the 1960s and 1970s; from Cheit, Lanier-Andersen, Wynn, Bowen-Minter through Lupton et al and Change Magazine; from an earlier Tickton to the new Millett and the numerous national, regional, and professional Commission reports and the annual studies circulated by state associations of independent colleges and universities, the same elements and data appear time and time again.

There is in use enough of a common vocabulary to suggest that the analysis to which data are being subjected is more than a mere rite. There exist enough well-known ratios without which no self-respecting student would want to enter the hallowed ground.

But is a commonality of language and data sufficient to give us the professional satisfaction that we have, indeed, agreed on the nature and scope of what we are describing? In the most general sense, I guess the answer must be in the affirmative; but in more specific terms, the jury is still out. I guess, all of us here today would more or less agree with this.

If, as has often been said, beauty is in the eye of the beholder, then the financial health of educational institutions is a thing of beauty. For, in spite of the common data and approaches that can be seen in the literature on the subject, each beholder injects quite properly his or her methodology and perspective into the final finding. In the absence of industry standard measures and benchmarks, how could it be otherwise!

Let me correct the last statement slightly. All of the studies that have during the last three decades spoken to the financial health question have either relied on or established statistical benchmarks, and some have derived from the statistical measures norms for future behavior. And I guess when a group of people begins to practice what others have said they should do, we have more than random juggling of meaningless figures.

What I am driving at is more pointed: to the best of my limited knowledge there is no well-articulated format or set of rules that, if followed by individual managers, would allow an outside observer to tell at a glance whether the business in question is financially in good or bad shape. I hasten to add that in the "for profit" world of corporations such judgments are not made easily either, but what one learns at the Harvard Business School on the subject is not all that different from what Stanford or SMU teach their students. Judging whether a college or a university is financially healthy may require much more subtlety than evaluating the financial condition of a corporation; but this is not reason why we cannot reach some consensus on how we should go about this task.

A question of particular concern is how one ought to account for changes in the quality of educational outputs. The normal economist approach that sees quality differences in price differentials will not work in an industry whose prices bear little if any relation to the cost of production. And the related physical productivity concepts are repugnant to institutions which self-consciously believe that cost data embodying qualitative changes ought not to be treated statistically as if they were not there.

If the quality issue complicates matters, financial analysis proper is not an easy thing either. John Minter will take up the more perilous matters of balance sheets. I was lucky to draw the less complicated issue of cash flows. But before I turn to them, I should like to make a concluding remark concerning pitfalls in the financial measures game.

If I read the signs correctly, we are about the embark on a comprehensive "indicators" quest where no stone shall remain unturned. As a devotee of "holistics" I am all in favor of unified theories, elegant models, and comprehensive sets of variables intertwined for an all-consuming purpose. But if this is our ambition, a workable consensus will be slow in coming. And we need some answers immediately with methodologies that have been well accepted in other parts of our economy.

Thus what I am about to describe is not only feasible, but it is feasible now without any major changes in internal accounting procedures. Nor is it necessary to invent a theory or to create a new model of anything.

Financing Colleges and Universities in the Short and Long Run

Let me make a disclaimer at this point: what follows is not in any sense an innovation in financial analysis. The novelty is in its application to higher educational institutions and specifically in the form that will be illustrated.

Two elements are central to the analysis. The first derives from Marshallian economic theory. It is the concept that, in order to survive in the short run, a firm or enterprise must cover all of its variable costs. In other words, revenues must be adequate to pay for those expenditures that make daily operations possible, but not necessarily sufficient to pay off capital investments. In business, Marshall pointed out that the "price" would have to be set so that this result could be achieved. Beyond this, he argued that in the long run, price would have to be large enough or total revenues should be adequate to cover all costs, variable and fixed. Thus the long run includes payment of capital costs.

Higher education never really has got its act together when it comes to distinguishing operating or short-run from capital or long-run expenditures. Instead we speak of current funds revenues and expenditures; and these already are a mixture of short and long run, variable and fixed costs; and then we add plant fund expenditures, which are mostly of the fixed variety.

The second element concerns the multiple nature of annual revenues; collegiate accounting succeeds in making a complex system of cash flows more complex by its distinction between restricted and unrestricted revenues. This is not said in criticism but merely to make clear the true complexity of the problem. If one realizes that collegiate budgets normally tend to encompass less than the sum total of expendable revenues and when one looks at how some of the more complex public and private institutions distinguish among and manage their numerous restricted current funds, one begins to have an idea of just how complicated an endeavor it can be to analyze collegiate institutional money flows.

In summary, then, it is worthwhile to remember the following: (1) current funds revenues and expenditures represent a mixture of operating and capital items; (2) the bulk of current expenditures is not normally of a capital nature in the conventional business sense of the term; (3) revenues have multiple origins with causes that are unique to each source; (4) the presence of restricted and unrestricted current revenues complicates matters but should not invalidate the basic Marshallian distinction between short- and long-run financing.

If we set aside restricted capital revenues for new plant, for endowments, and for other than the current fund, the principle of the analysis we are suggesting centers on the following rule: If an organization is to remain a going concern over time, total current revenues must be sufficient to defray both short- and long-run costs; that is, both variable and fixed costs. How many colleges and universities can meet this test?

A critical aspect of the "financial health" dimension is the determination of how large the capital charge against current revenues should be each year.

Here a difficulty in definition arises in that one must extract from the operating budget all items that can properly be called "capital" expenditures. Some of these, as in the case of new equipment, represent acquisition of new wealth or assets. If they are financed partially with borrowed funds, a liability appears on the Balance Sheet that must eventually be repaid. Major equipment replacement and plant improvements pertain to capital assets acquired in the past. Since transfers for plant debt amortization are common in collegiate financial statements, this capital expenditure is relatively easy to identify.

Between the strictly operating and the capital expenditures lies the charge for interest. Here we should prefer a distinction between interest for short-term borrowings (necessitated because collegiate revenues fluctuate to a large extent independently of monthly expenditure requirements) and interest payments that pertain to capital debt.

The determination of what are in any given year the actual capital expenditures (again, not counting new plant construction) is a first step. Within a national effort of financial health analysis, it may be necessary to ask the accounting profession to establish some guidelines; consensus making is essential here.

As for setting up normative guidelines for what a capital charge ought to be, at least two approaches are now in use. The first centers on the idea of capital depreciation or capital consumption. Accordingly, it is assumed that plant and equipment wear out at a certain rate. A frequent rule of thumb used is the 50-year write-off, a period that seems very long when one considers the rate at which equipment must be replaced and the speed with which some relatively recent new buildings

are becoming programmatically obsolete. The full integration of a depreciation policy has proved to be too complicated for many colleges and universities; therefore, if they have ventured into this field at all, they simply charge a small percentage of total plant and equipment investments; two percent is not an uncommon charge. One recalls in this connection Sidney Tickton's recommendation in the late 1950s that colleges begin to make at least a modest charge for depreciation.

The second approach is somewhat more complicated but perhaps less arbitrary as well. It has two elements. First, the institution makes a long-range equipment replacement and plant improvement plan or budget. It also constructs a time-weighted debt reduction plan. Both of these plans produce an average charge against current revenues, and together they represent the capital charge.

In the years during which actual capital expenditures are less than the capital charge, reserves should be built up against which the institution will draw when the annual capital charge is less than actual capital expenditures. Of course, reserves can be built up only as long as some unrestricted net revenues are left after the capital charges have been made.

It is important to understand that this is not the whole story if we want to measure comparative financial health, but an essential first step. Knowledge of the size of reserves, fully funded ones by the way, will tell us something about the institution's future vulnerability or lack of it. The next two factors to be discussed provide additional information designed to classify institutions into groupings describing their relative financial health.

The Structure of Revenues

The term cash flow analysis is normally reserved for studies designed to help balance short-range cash flow requirements with minimum borrowings throughout a given business year. I use the expression here in a somewhat broader sense. We are focusing on net cash or revenue flows from all sources, over time, in order to determine what, if any, changes in the revenue structure are taking place.

Two overlapping survey instruments have been designed and are in use today.

Central to this sort of analysis is the dissection of the net revenues that derive from and on behalf of students, followed by the already well-established analysis of all other institutional revenues by source.

Normally, except for the research universities, student-related revenues will account for 60 percent or more of total revenues. This

fact, by the way, immediately suggests one of the obvious yet seldom used rationales for classifying institutions in comparative studies: compare those institutions that fit into a reasonable neighborhood for the relative weight of student-related revenues and do not compare 60 percenters with 85 percenters unless there are sound reasons because of other key similarities.

Not only the weight of this net revenue flow is worth noting. Its composition is of the essence today. It is here that we find the most significant structural revenue changes. And these structural changes should be a central feature of financial health studies, however broadly or narrowly we define the concept of health.

If one wanted to collect the requisite data from generally available sources, and if time and money were not an issue, most of the pieces could probably be put together. The procedures would be extremely time consuming and it would be well-nigh impossible to come up with timely reports. Thus, to date, it has been necessary to go directly to the institution. Audited financial statements are not helpful either, because most annual reports do not readily provide date on student-fee-based revenues in the auxiliary enterprises. And because of a wide variety of food service contract arrangements, it may not be possible to generate in each instance the true student-related revenue data.

Compared with revenue studies that rely solely on audited financial statements, the analysis depicted or implied by the various exhibits (see attachments) establishes a key linkage with some of the major policy variables that define modern and evolving student aid financing. The analysis can tell us how institutions differ in their respective reliance on specific aid components and how such differentiation affects their comparative financial standing. For each institution, the analysis also provides signals for future action. In our as-yet fragmentary studies, we see groups of institutions whose dependence on unfunded aid has been growing; we contrast groups with increasing from those with decreasing reliance on public monies; we can isolate present financial strength or weakness; and we can speculate on certain future consequences should present practice continue according to specifically assumed trends.

We also note from our data that broad sweeping conclusions may not be appropriate. Much has been said lately and in the past about the perils inherent in so-called unfunded student aid. Our data suggest to us that many institutions can indeed afford the practices that have led to increases in the relative weight of straight, unfunded discounts. Others are holding a more or less neutral course. And some -- an increasing number -- are putting body count ahead of financial soundness. Unfunded discounts are neither good nor bad per se; the point is to discover when and when not to have them.

At issue in the entire investigation into the changing nature and structure of student-related new revenues is the complex problem of how managers go about maximizing net cash or revenue flows and how this crucial step relates to the decision rule postulated earlier.

The Expenditure Structure

One of the common elements in the literature on the financial condition of higher education is the tradition of dividing collegiate expenditures into the several well-known functional subclassifications. Less frequent and, officially at least not required or even recommended, is the classification of expenditures for each function by major accounting line-item groupings.

Financial health and adequacy have quite a bit to do with how individual institutions finance their operating activities. Knowledge of the types of expenditures that constitute the line-item budget is one of the necessary ingredients. Does it seem unreasonable to ask that we report expenditures by identifying some or all of the following:

Faculty salaries
Officers' salaries
Other salaries and wages
Student wages, including work-study
Nonwage benefits
Employee tuition benefits
Professional services

Support costs, including office supplies
Library acquisitions
Classroom and laboratory supplies
Plant maintenance
Utilities
Other operating costs

Interest on debt
Debt reduction
New equipment
Improvements and replacements

Structural changes have taken place recently in this expenditure pattern, chiefly because of high inflation rates on the one hand and sharp expenditure cutbacks on the other. And with the moderation in many institutions of salary and wage inflation, the percentage of current funds allocated to the personnel component has been declining in many institutions. If one wants to establish a bridge between financial data and program activity, this line-item structure provides a convenient first step since it allows us to translate existing and changing expenditure patterns from current into constant dollars.

While this aspect of our current research is not part of the topic spelled out in your program, I consider it an essential ingredient of financial indicator work.

Conclusion

I believe that the type of information referred to in this presentation has value both to management and in policy-making. When we ask the question about the adequacy of net revenues so that the institution may function in the long run, we are accomplishing at least two tasks. We are setting a performance norm against which actual yearly achievements can be measured. We are also alerting policy-makers to the overall funding requirements of groups of institutions and of the industry as a whole.

This is not to suggest that every college and university now in the land should somehow be financed at the indicated levels. But it would be possible to classify institutions with respect to their relative proximity toward achieving the long-run objective.

The study of the changing revenue structure in some such detail as has been illustrated would in a similar manner provide managerial and policy information. The managers should know how their individual revenue flows are behaving and how past and current developments affect future financial performance and viability. Policy-makers can gain insight into the effects of their activities on institutions and on students and into whether anticipated objectives are in fact being met.

Finally, it is possible from the above to conclude that comparative studies should and can lead to more than statistically derived norms for judging individual or group financial performance. It may be comforting to know that one ranks in the top 25 percent of endowed institutions in terms of total return on investment; but when this means that you are losing your money a bit less fast than the rest, surely the finding is essentially dismal. This illustrates just about where most collegiate financial analysis rests today in the absence of more concrete performance norms.

I hope that at least some of what I have shown moves in the direction of giving us some of these norms. If this is so, then maybe we have been asking some of the right questions.

NOTES ON EXHIBITS

Exhibit 1 represents a restatement of current funds revenues and expenditures but is essentially consistent with the figures of the normal audit.

In addition, it lifts out of the latter some key indicators of financial condition, such as reserve funds, restricted fund balances, and net worth. It is not yet as refined as we hope to make it; in particular, we are attracted to the Wilkinson idea of dividing balance sheet items into expendable and nonexpendable groups. At the moment, many restricted fund balances are expendable; some are conditionally expendable.

Definitions

1. Revenues for Current Operations: These include normally budgeted and documentable annual revenues directly received for operating the College.

   The Gift component includes non-capital gifts that are recurring each year (unrestricted) and all restricted gifts used to cover instructional and other operating expenditures.

   External student aid revenues have been netted out; they are detailed in the next two exhibits.

2. Expenditures for Current Operations: These include all non-capital operating expenditures included in the annual budget.

3. Net Revenues from Operations: 1 minus 2.

4. Interest on Plant Debt: This includes the gross interest; ideally it should exclude interest charges resulting from short-term borrowing.

5. Capital Charge: In this instance, calculated as follows: sum of a + b;
   (a) five-year plant improvement and equipment replacement budget; about $442,000 per year.
   (b) weighted long-term debt retirement average each debt item using its own maturity terms; about $409,000 in 1977-78.

6. Other Unrestricted Gifts and Revenues: Annually, current unrestricted revenues include items that may not have been included in the budget; as a matter of fact, the existence of such funds in itself may be a sign of financial health. Examples are: unrestricted bequests, special unrestricted gifts solicited but not prebudgeted, and some that may have been unexpected "windfalls" or unsolicited gifts.

The Consolidated Balance Sheet

This version, Exhibit 2, differs slightly from Bill Wilkinson's; our audit contains a version that is identical to his.

A comment was made at the meeting concerning market versus book value for asset reporting. Our trustees have been discussing a dual presentation: report both book and market value and explain differences in trends in appropriate notes or supplementary papers.

A key problem in financial reporting has been that one group seems to impose a method on another group, regardless of appropriateness.

For endowment fund reporting, our trustees have shown a clear preference for market value reporting; since funds functioning as endowment often serve as collateral for debt, market changes are an important signal of how well the debt is covered (as in a margin account); book value or original cost would be most misleading.

Plant funds, other than invested funds, are traditionally stated in historical terms; this does not take into account construction cost inflation or replacement costs; some institutions are using replacement cost figures which are at best guesses; very few buildings would be replaced in their present form.

Undepreciated property represents another reporting problem; colleges and universities experience capital consumption like everyone else; disregarding inflation, not accounting for depreciation in this capital consumption sense is overlooking a cost of production that is real even if the building was given. But these are touchy as well as difficult points to argue since opinions differ widely.

If one were to report one's assets conservatively in higher education, one could ask what is salvageable in a distress sale and at what prices, remembering that when one must sell one seldom gets top value for property. Some items are not saleable because of what the law says; true endowment, for instance. What would the state pay for taking over a private college? If the state would simply take over all the existing liabilities, the value would really be limited to this amount.

Somehow, financial analysis must zero in on what is expendable; and this in turn tells us something about management's freedom of action or lack of it in financial terms vis-a-vis present and future liabilities and future events.

Other Variables

Since one of our concerns is with long-range stability both in program and in finances, we have developed specific reserve funds to help stabilize both the academic program and the plant improvement efforts. We expect to build these reserves high enough to provide a five- to eight-year stability potential.

In addition, "funds functioning as endowment" provide a last-resort stability in some such terms as the following: at an annual revenue shortfall of $450,000, the College has an estimated 11-year planning potential to get back onto a viable track. Because of sharp fluctuations in market values of investments, this time horizon has dropped as low as 6.7 years, another reason why market valuation of endowment investments makes sense.

As for the changes in restricted fund balances, they round out the picture; the details are available with supplementary notes in the Audit. Our trustees believe that these documentations provide them with a better fix than they have had in the past.

But they are not satisfied that this is the last or best format; we do consider it an advance over existing data, however.

Exhibit I

SUMMARY STATEMENT OF 1975 - 78 FINANCIAL CONDITION

	Actual 1975	Actual 1976	Actual 1977	Budget and Estimates 1978
1. Revenue for Current Operations (p.3)	$ 9,583,906	$ 9,949,129	$11,145,221	$11,719,000
2. Expenditures for Current Operations (p.2)	9,037,405	9,404,937	10,213,857	10,882,725
3. Net Revenue from Operations	546,501	544,192	931,364	836,275
4. Minus: Interest on Debt	467,547	319,320	285,395	258,240
Sub-total	78,954	224,872	645,969	578,035
5. Minus: Capital Charge	462,305	851,000	884,000	851,000
6. Net Revenue (or Deficit) after Capital Charge	- 383,351	- 628,128	- 238,031	- 272,965
7. Plus: Other Unrestricted Gifts and Revenues	+ 459,581	11,129,044	+ 488,031	+ 280,000
8. Total Net Revenue (Deficit) from all sources	+ 76,230	+ 500,916	+ 250,000	+ 7,035
9. Allocation of Net Revenue (or Deficit);				
a. Transfer to (from) Plant Maintenance and Debt Reduction Reserve Fund	-0-	370,416	-0-	-0-
b. Transfer to (from) Educational Development & Stabilization Reserve Fund	-0-	245,500	100,000	-0-
c. Transfer to (from) Trustee Designated Endowment	-0-	(115,000)	150,000	-0-
10. Unallocated Balance	76,230	-0-	-0-	7,035
11. Reserve Fund Balances:				
a. Plant Maintenance and Debt Reduction Reserve Fund;	-0-	599,712	741,595	705,274
b. Educational Development and Stabilization Reserve Fund;	-0-	245,500	345,000	345,500
c. Government Bond Reserve Funds;	156,961	381,794	407,229	432,000
12. Net Change in Restricted Fund Balances	1,094,197	676,421	2,506,654	NA
13. Consolidated Net Worth	$38,078,739	$41,007,647	$44,475,586	NA

October 4, 1977

EXHIBIT 2

CONSOLIDATED BALANCE SHEET
THE COLLEGE OF WOOSTER
For Years Ended June 30, 1973, 1974, 1975, 1976 and 1977

ASSETS	1977	1976	1975	1974	1973
CURRENT ASSETS					
Cash	$ 304,542	$ 108,222	$ 183,594	$ 177,837	$ 214,159
Investments - at market	1,702,354	1,094,980	195,921	503,945	1,199,857
Accounts Receivable	422,823	413,460	326,484	378,287	205,106
Inventories	293,452	283,538	254,590	264,325	236,588
Deferred Charges	97,006	107,590	144,131	146,502	183,512
Current Portion-Sinking Fund Reserves*	19,319	20,888	24,638	22,477	22,781
Total Current Assets	$ 2,839,696	$ 2,028,678	$ 1,109,358	$ 1,493,343	$ 2,062,003
OTHER ASSETS					
Student Loans Receivable	$ 2,335,920	$ 2,141,649	$ 2,060,409	$ 1,973,052	$ 1,837,766
Endowment Investments-at Mkt.	17,111,017	15,673,997	14,588,652	13,065,582	14,913,375
Land, Bldgs, Eqt.	28,024,896	27,925,631	27,545,180	26,216,337	25,512,747
Sinking Fund Reserves	387,710	360,906	332,325	304,900	282,119
Total Other Assets	$47,859,543	$46,102,183	$44,526,566	$41,559,871	$42,566,007
TOTAL ASSETS	$50,699,239	$48,130,861	$45,635,924	$43,053,214	$44,628,010

*Note that portion of Sinking Fund Reserves is included in Accrued Expenses as a Current Liability

LIABILITIES	1977	1976	1975	1974	1973
CURRENT LIABILITIES					
Accounts Payable	$ 659,350	$ 834,757	$ 756,730	$ 748,568	$ 908,268
Accrued Expenses*	383,297	347,506	354,771	351,335	401,472
Prepaid Tuition	245,247	278,031	309,406	302,520	301,805
Short-Term Notes Payable	300,000	600,000	725,000	300,000	800,000
Current Portion of Long-Term Debt	282,000	382,166	464,000	723,000	303,000
Total Current Liabilities	1,969,894	$ 2,442,460	$ 2,609,907	$ 2,423,423	$ 2,716,545
LONG-TERM LIABILITIES					
Notes Payable	$ 1,743,051	$ 2,294,586	$ 2,488,258	$ 2,361,282	$ 2,899,345
U.S. Govt. Dorm Bonds	1,276,000	1,316,000	1,340,000	1,372,000	1,403,000
National Direct Loans-U.S. Government	1,234,708	1,070,168	1,119,020	1,089,754	1,010,773
Total Long-Term Liabilities	$ 4,253,759	$ 4,680,754	$ 4,947,278	$ 4,823,016	$ 5,313,118
TOTAL LIABILITIES	$ 6,223,653	$ 7,123,214	$ 7,557,185	$ 7,246,439	$ 8,029,663

NET WORTH	1977	1976	1975	1974	1973
LONG-TERM CAPITAL					
Plant Funds	$26,305,910	$23,421,353	$22,660,196	$22,002,592	$20,529,163
Endowment Funds:					
Restricted	6,318,530	6,048,582	NA	NA	NA
Funds Functioning As Endowment	5,029,169	4,965,981	NA	NA	NA
Total	$11,347,699	$11,014,563	$10,882,998	$10,643,560	$10,308,100
Student Loan Funds	757,931	745,952	728,512	743,666	733,599
Total Long-Term Capital	$38,411,540	$35,201,868	$34,271,706	$33,389,818	$31,760,862
SHORT-TERM CAPITAL					
Reserve Funds:					
Plant Maint. & Debt. Reduction Res.	$ 741,595	—	—	—	—
Educational Devel. & Stabilization Res.	345,300	—	—	—	—
Sinking Funds - Governing Bonds	387,710	360,906	332,325	304,900	282,119
	$ 1,474,605	$ 360,906	$ 332,325	$ 304,900	$ 282,119
Net Realized, Unrealized Gain From Investments	6,006,734	4,443,099	3,373,359	1,870,659	4,385,403
Current Funds Balance:					
Restricted	382,307	339,458	371,671	475,398	498,380
Unrestricted	-0-	661,316	(170,322)	(234,040)	(28,417)
Total Current Funds Balance	$ 382,307	$ 1,001,774	$ 101,349	$ 241,358	$ 469,963
Total Short-Term Capital	$ 7,863,646	$ 5,805,779	$ 3,807,033	$ 2,416,957	$ 4,837,485
TOTAL NET WORTH	$46,475,186	$41,007,647	$38,078,739	$35,806,775	$36,598,347

Rene H. Jenny
William H. Snoddy
October 3, 1977

EXHIBIT 3

NET CASH FLOW ANALYSIS FROM / FOR STUDENTS

	1972	1973	1974	1975	1976	1977
A. Revenue from Student Charges:						
a. Gross Tuition and Fees						
b. Dormitory Fees						
c. Food Service Fees						
Sub-Total A.						
B. Student Aid Income (Restricted)						
a. Endowment						
b. Gifts						
c. State Appropriations-OIG, FHEAA						
d. Federal Grants-SEOG, NEOG						
e. Other						
Sub-Total B.						
C. Expenses for Student Aid Grants						
a. Funded (Or Restricted)						
b. Unfunded						
Sub-Total C.						
Net Total: (A + B) - C =						
D. Work Study						
a. Revenues						
b. Expenditures						
E. Loans						
a. Institutional						
b. NDSL						
c. FISL						
e. Other						
F. Enrollment						
a. Body Count						
b. FTE Academic (On campus only)						
c. FTE Financial (On campus only)						
G. Operating Budget						
a. Current Operating Revenues*						
b. Current Operating Expenditures*						
Operating surplus/deficit						

*These should correspond to normal operating budget including interest expense on plant debt and debt amortization payments; exclude capital transfers to/from other funds.

College _____ Respondent _____

6/77

EXHIBIT 4
Statewide Policy and Planning Information Network (SPPIN)

UNDERGRADUATE STUDENT AID QUESTIONNAIRE - FY 1977
(or Academic Year 1976-77)

INSTITUTION _____ FICE # _____

Completed By _____ Title _____ Phone _____

GENERAL INFORMATION:

Veterans Enrolled _____ # Receiving OASDI (Social Security Benefits) _____

Children of Veterans _____ # On Vocational Rehabilitation _____

Tuition and Fees _____ Room and Board _____

SOURCES OF INCOME FOR GRANT PURPOSES: (monies applied during fiscal year.)		Number of Awards Made*	Total $ Amount of Awards
1. Endowment Income Restricted to Student Aid		_____	_____
2. Gifts & Grants (Private: administered by college)		_____	_____
3. State Aid	OIGs	_____	_____
4.	Other States	_____	_____
5. Federal Aid Appropriations:	BEOG	_____	_____
6.	SEOG	_____	_____
7.	LEEP	_____	_____
8.	Other Grants	_____	_____
9. All Other Funded Sources: _____		_____	_____
10. TOTAL AWARDS AND DOLLARS FROM ABOVE SOURCES (lines 1-9)		_____	_____
11. Unfunded Grants from institutional funds not reported in 1-9		_____	_____
12. TOTAL AWARDS AND DOLLARS (10 + 11)		_____	_____
13. Tuition Remission (including fee waivers, discounts, etc.) IF INCLUDED ABOVE, INDICATE LINE #_____.		_____	_____
WORK			
14. CWSP (Federal Share)		XXXXXX	_____
15. Total Work Study Expenditures (Including Institutional Matching Funds)		_____	_____
16. Non-Work Study Student Payroll (Exclusive of Above)		_____	_____
17. TOTAL WORK PROGRAMS AWARDS AND DOLLARS (15 + 16)		_____	_____
LOANS			
18. NDSL (Include 1/9 Institutional Contribution)		_____	_____
19. FISL-GSL: Institutional Funds Only		_____	_____
20. Other Loans From Institutional Funds		_____	_____
21. TOTAL LOANS (18 + 19 + 20)		_____	_____
22 GRAND TOTALS (12 + 13 + 17 + 21)		_____	_____

23. UNDUPLICATED NUMBER OF STUDENTS RECEIVING ALL TYPES OF AID AWARDS_____

24. Total Student Budget (CSS) for residents $_____ Commuters $_____

SOURCES OF INCOME FROM STUDENTS

25. Gross tuition and Fees $_____

26. Student-generated Income from Dormitories $_____

27. Student-generated Income from Food Services $_____

*Number of students receiving awards from each source.

Please return to: A.I.C.U.O., 50 W. Broad St., Suite 711, Columbus, Ohio 43215

ANOTHER APPROACH TO INSTITUTIONAL CLASSIFICATION

Kent Weldon
National Center for Higher Education Management Systems

There has been, and continues to be, a need to summarize information about educational institutions. Researchers and analysts dealing with specific issues and using computers to organize and analyze data can summarize data according to whichever criteria are relevant to the problem at hand. It can be expected, however, that most users of data collected by the National Center for Education Statistics (NCES) and other data collection agencies will have to rely on summary data distributed in published form. To support this general type of use, it is necessary to formulate categories of institutions that can serve as a basis for summarizing various kinds of educational data.

Criteria for a Categorization Scheme

The scheme for institutional classification finally selected should meet several basic criteria:

1. The classification scheme should be designed to encompass the full range of institutions whose primary mission is to provide postsecondary education.

2. Within this broad range, the categories should be collectively exhaustive and mutually exclusive.

3. The criteria for assigning institutions to categories should be objective. That is, there must be a set of criteria that consistently and uniquely identify the category to which an institution is to be assigned; these criteria should be such that, when applied by different individuals, any given institution will be consistently categorized.

4. Finally, and most important, the categorization scheme must serve to support analysis and communication about postsecondary education. In this context, the classification scheme must be analytically sound: It must serve to categorize institutions into relatively homogeneous groupings. In addition, the categories must have meaning to the typical user. (The categories must be descriptive and must aid in communicating to the layman.) And the scheme selected must be able to serve as a common basis for publication of data at the state and national levels. Thus the classification scheme must have sufficiently few categories to make data publication feasible (with the possibility of more detailed subcategories within major categories available for use as necessary).

One classification structure currently being tested at the National Center for Higher Education Management Systems (NCHEMS) appears in Chart A. It should be noted that this classification structure is not dramatically different from the Carnegie classification. In the proposed structure we have reduced (from Carnegie) the number of distinctions made among research, doctoral, comprehensive, and liberal arts schools. Essentially, this reduction reflects the difficulties in making rather refined distinctions at these levels, and in the problematic utility of such distinctions. The second major departure from Carnegie is reflected by a greater level of distinction in the proposed classification among two-year schools. This seems warranted since (1) reasonable distinctions can be made easily, and (2) the two-year classification is large (in terms of the number of institutions categorized).

The classification outlined in Chart A is defined in Chart B. That is, we have stated detailed criteria for assigning individual institutions to specific classifications. For reference purposes we have contrasted the proposed classification with the Carnegie classification. Both schemes make liberal use of "thresholding"--i.e., excluding institutions from a classification until there is "solid" evidence of the required criterion. For example, an institution granting one Ph.D. degree will not be considered (under either scheme) a Doctoral-Granting Institution because there is little evidence of the required doctoral-granting activity.

The problem of determining reasonable thresholds is both judgmental and analytical. The criterion for distinguishing between "research" and "other" universities was selected as $14 million of research expenditures largely because a rather pronounced break-point in research expenditures occurred at that level. The criteria for distinguishing two-year schools were selected as the approximate break-points in a distinctly tri-modal distribution of emphasis on academic vs. occupational degrees. It should again be stated that we would place more emphasis on creating an explainable and analytically-useful grouping of institutions vs. trying to minimize the marginal effects of various classifications on individual institutions.

Charts C and D present a comparison between the NCHEMS classification scheme and the two classification schemes now in common use. Chart C compares this classification with the commonly-used NCES classifications of two-year/four-year/university. While certain classification anomalies inevitably appear here, there are some fundamental differences between the systems--most notably involving the NCES definition of "university" and the proposed definition of "doctoral-granting." While it is not surprising that the proposed classification "demotes" 29 NCES universities to "comprehensive" status (because of the rather rigorous requirements involving both

number of degrees granted and number of degree programs), it is very interesting that 36 institutions classified by NCES as "four-year" are classified as "doctoral-granting" by the proposed scheme. On further investigation, these institutions essentially turn out to be comprehensive schools which have grown into significant doctoral degree producers.

Chart D compares the proposed classification scheme with the Carnegie classification scheme. The first thing to note from this table is that there is significant agreement between the two schemes for the major groupings (doctoral institutions, comprehensive, etc.). For example, out of the 168 institutions in the doctoral group of the proposed scheme, only 11 are not classified as doctoral in the Carnegie classification. Similarly, out of the 168 schools in the Carnegie doctoral group, only 16 are not classified as doctoral in the proposed classification. Some of this discrepancy is explained by noting that the Carnegie classification is four years old and that some comprehensive schools may now be granting doctorates. Consistency between the two classifications holds across the other major groups, although not quite as strongly as with the doctoral-granting institutions. Some discrepancies begin to appear at the sub-class level; this can be observed for the doctoral-granting schools which are research-oriented versus those schools with less of a research emphasis.

Within the particular classes of specialized schools, considerable variability can be noted. For example, only 23 out of the 42 schools classified by Carnegie as engineering schools are classified as such by the NCHEMS classification scheme. This variability can be attributed to differences in the criteria used to classify specialized or professional schools. (See Chart B.)

At the subgroup level, the largest discrepancy between the two schemes occurs within the Carnegie Comprehensive II/Liberal Arts I groups and the proposed Comprehensive/General Baccalaureate groups. The rather large discrepancy in this case appears to be due primarily to the criteria used. The Comprehensive II class is defined by Carnegie as those schools with a liberal arts program plus at least one professional program and enrollments of over 1,000 students. For the proposed Comprehensive class, only those schools which grant over 30 master's degrees in at least five master-level programs are placed in this group. Hence, a primarily baccalaureate institution classified as Comprehensive II by Carnegie would be placed in the General Baccalaureate group in the proposed classification scheme.

Importance of Institutional Classification in Understanding Financial Indicators

Institutional classification studies clearly affect many efforts to gather, analyze, and exhibit information on postsecondary education. One of the efforts most affected is indicators development, and we see updated classification systems here as making several contributions:

- In assessing financial condition, it is important to start from a reasonable and well-defined a priori classification structure which is not overtly influenced by the financial condition of individual institutions.

- Institutional classification permits specialized indicators to be assigned to particular groupings of institutions.

  - Some indicators simply are not useful across the range of postsecondary institutions.

  - It is often hard to tell when an indicator is inappropriate and when it is simply widely variable (perhaps implying financial strengths, weaknesses) of the same indicator.

- To the extent that standards are created for financial indicators, institutional classification provides the opportunity for some "fine-tuning" of these standards.

- The primary rationale for any institutional classification is to improve the communication of information about subgroups of institutions. This requirement is especially important in indicators development because raw (measurable) data are more removed from inspection.

Next Steps

We emphasize that the classification scheme proposed above is only one of many useful schemes. Our focus is not (at this stage) to make definitive suggestions on such schemes, but rather to explore the problem and solicit comments from the community. We have investigated other models previously, and are currently investigating modifications to the scheme proposed above as well as some markedly different schemes. These investigations will result, we hope, in a classification system which will facilitate the transmission and interpretation of postsecondary education data.

Chart A

Proposed Classification Structure

A. Major Doctoral-Granting Institutions

1. Research Universities
2. Other Universities

B. Comprehensive Institutions

C. General Baccalaureate Colleges

D. Professional Schools

1. Divinity Schools
2. Comprehensive Health Schools
3. Other Health Schools
4. Engineering Schools
5. Business and Management Schools
6. Art, Music, and Design Schools
7. Law Schools
8. Teachers Colleges
9. Military Schools
10. Other Professional Schools

E. Community/Junior Colleges

1. Comprehensive Community/Junior Colleges
2. Academic Community/Junior Colleges

F. Multiprogram Occupational Schools (Comprehensive Vocational/Technical)

G. Single-Program Occupational Schools (Specialized Vocational/Technical)

1. Business/Commercial Schools
2. Cosmetology/Barber Schools
3. Flight Schools
4. Health Training Schools (Hospitals)
5. Health Training Schools (Non-Hospital)
6. Arts and Design Schools
7. Trade Schools
8. Other Schools

Chart B

Criteria Distinctions Between Carnegie and NCHEMS Classifications

Carnegie	NCHEMS
1. Doctoral-Granting Institutions	A. Major Doctoral-Granting Institutions - At least five Ph.D. programs and - At least thirty Ph.D. degrees
1.1 Research Universities I - Fifty most heavily funded with federal support - Awarded at least fifty Ph.D.'s	A.1 Research Universities - At least $14 million in research
1.2 Research Universities II - Next fifty leading institutions in terms of federal support - Awarded at least fifty Ph.D.'s	A.2 Other Universities - Non-A.1 doctoral-granting institutions
1.3 Doctoral-Granting Universities I - At least forty Ph.D.'s, or - Received at least $3 million in federal support - Twenty Ph.D.'s minimum in either case	
1.4 Doctoral-Granting Universities II - Awarded at least ten Ph.D.'s	
2. Comprehensive Universities and Colleges	Comprehensive Colleges and Universities
2.1 Comprehensive Universities, Colleges I - Liberal arts program plus other more specialized programs - May have master's programs, but no Ph.D. programs - At least two professional/ occupational programs - At least 2,000 students	- At least five master's level programs and - At least thirty master's degrees

Chart B

Criteria Distinctions Between Carnegie and NCHEMS Classifications (Continued)

Carnegie	NCHEMS
2.2 Comprehensive Universities, Colleges II - Liberal Arts program plus at least one professional program - At least 1,500 students (private) or 1,000 students (public)	
3. Liberal Arts Colleges 3.1 - Selectivity Index of at least 5 or - Among 200 leading baccalaureate-granting institutions 3.2 Liberal Arts Colleges II - All liberal arts colleges not classified as 3.1	C. General Baccalaureate Schools - BA programs offered with degree completers - BA degrees granted
4. Two-Year Colleges and Institutions - No criteria cited	E. Community/Junior Colleges - Two-year academic or occupational degrees/certificates offered E.1 Comprehensive CC/JC's - Ratio of academic degrees to total degrees $\leq .6, \geq .4$ E.2 Academic CC/JC's - Ratio of academic degrees $> .6$ F. Comprehensive vocational/technical - Ratio of academic degrees $< .4$
5. Professional and Other Specialized Schools 5.1 Theological Seminaries, Bible Colleges, etc.	D. Professional Schools - Less than ten BA, MA, Ph.D. programs

Chart B

Criteria Distinctions Between

Carnegie and NCHEMS Classifications (Continued)

Carnegie	NCHEMS
	1. Divinity Schools - Ratio of all HEGIS 2300 Degrees and professional divinity to total degrees $>.5$
5.2 Medical Schools and Centers - Centers may include other health professional schools	2. Medical Schools - Ratio of health degrees to total degrees $>.5$ - MD's 0 and ratio of MD's to total degrees $<.8$
5.3 Other separate Health Professional Schools	3. Other Health Schools
5.4 Schools of Engineering, Technology - Award bachelor's degrees - Technical fields of study only	4. Engineering Schools - Ratio of all HEGIS 0900 degrees to total degrees $>.5$
5.5 Schools of Business, Management - Award at least bachelor's degree - Business fields of study only	5. Business, Management Schools - Ratio of all HEGIS 0500 degrees to total degrees $>.5$
5.6 Schools of Art, Music, Design	6. Art, Music, Design Schools - Ratio of all HEGIS 1000 degrees to total degrees $>.5$
5.7 Schools of Law	7. Law Schools - Ratio of all HEGIS 1400 plus professional law degrees to total degrees $>.5$
5.8 Teachers Colleges	8. Teachers Colleges - Ratio of all HEGIS 0800 degrees to total degrees $>.5$
5.9 Other Specialized Institutions - includes graduate centers, maritime academies, military institutions lacking a liberal arts program	9. Military Schools U.S. service school 10. Other Specialized Professional Schools - At least one but less than four BA, MA, and Ph.D. Programs

Chart C

NCHEMS CLASSIFICATION WITH NCES TYPE

TOTAL

	TOTAL	HEGIS TYPE		
		UNIV	4-YEAR	2-YEAR
TOTAL	3,038	161	1,728	1,149
NCHEMS CLASS				
DOCT/RESEARCH	66	59	7	-
DOCT/NON-RES	102	73	29	-
COMPR	375	29	346	-
GEN BACC	753	-	752	1
DIVINITY	194	-	194	-
US SERVC SCH	10	-	8	2
MEDICAL	25	-	25	-
OTHER HEALTH	38	-	38	-
ENGR	33	-	33	-
BUSINESS	36	-	35	1
ART,MUSIC	48	-	48	-
LAW	12	-	12	-
TEACHING	36	-	36	-
OTHER SPEC	89	-	89	-
2-YR COMPR	257	-	1	256
2-YR ACAD	405	-	4	401
2-YR VOC/TECH	457	-	3	454
OTHER	4	-	4	-
NO DATA	98	-	64	34

NCHEMS CLASSIFICATION WITH CARNEGIE CODE

TOTAL

	TOTAL	NOT REPT	RESEA-RCH I	RESEA-RCH II	DO
TOTAL	3,038	190	50	37	
NCHEMS CLASS					
DOCT/RESEARCH	66	2	49	12	
DOCT/NON-RES	102	3	1	25	
COMPR	375	4	-	-	
GEN BACC	753	9	-	-	
DIVINITY	194	21	-	-	
US SERVC SCH	10	2	-	-	
MEDICAL	25	1	-	-	
OTHER HEALTH	38	2	-	-	
ENGR	33	4	-	-	
BUSINESS	36	1	-	-	
ART,MUSIC	48	3	-	-	
LAW	12	-	-	-	
TEACHING	36	4	-	-	
OTHER SPEC	89	21	-	-	
2-YR COMPR	257	5	-	-	
2-YR ACAD	405	26	-	-	
2-YR VOC/TECH	457	43	-	-	
OTHER	4	2	-	-	
NO DATA	98	37	-	-	

t D

CT I	DOCT III	COMPR II	COMPR II	LIB ARTS I	LIB ARTS II
51	30	331	142	141	568
2	-	-	-	-	-
42	21	31	11	21	-
7	8	248	46	14	31
-	1	76	88	119	449
-	-	-	-	-	19
-	-	-	1	-	-
-	-	-	-	-	-
-	-	-	-	-	1
-	-	-	-	-	-
-	-	1	-	-	9
-	-	-	1	-	-
-	-	-	-	-	1
-	-	-	5	1	13
-	-	-	-	5	40
-	-	-	-	-	-
-	-	-	-	-	1
-	-	-	-	-	1
-	-	-	-	-	1
-	-	3	-	-	2

Chart D

NCHEMS CLASSIFICATION WITH CARNEGIE CODE

TOTAL

	CARN CODE			
	2 YEAR	DIVI- NITY	MEDICAL	OTHER HEALTH
TOTAL	1,073	191	44	2
NCHEMS CLASS				
DOCT/RESEARCH	-	-	1	-
DOCT/NON-RES	-	-	1	-
COMPR	-	-	3	-
GEN BACC	-	2	-	-
DIVINITY	-	153	-	-
US SERVC SCH	-	-	-	-
MEDICAL	-	-	24	-
OTHER HEALTH	-	-	14	2
ENGR	-	-	-	-
BUSINESS	1	-	-	-
ART,MUSIC	-	-	-	-
LAW	-	-	-	-
TEACHING	1	1	-	-
OTHER SPEC	-	15	-	
2-YR COMPR	252	-	-	-
2-YR ACAD	378	-	-	-
2-YR VOC/TECH	410	1	-	-
OTHER	-	-	-	-
NO DATA	31	19	1	-

(Continued)

ENGR & TECH.	BUSI-NESS	ART, MUSIC,	LAW SCHOOLS	TEACHI-NG	OTHER SPEC
42	25	50	11	12	26
-	-	-	-	-	-
-	-	-	-	1	2
8	1	-	-	-	5
6	-	-	-	1	2
-	-	-	-	1	-
-	-	-	-	-	7
-	-	-	-	-	-
-	-	-	-	-	-
23	1	-	-	-	5
2	22	-	-	-	-
-	-	44	-	-	-
-	-	-	11	-	-
-	-	4	-	6	1
2	-	-	-	1	2
-	-	-	-	-	-
-	-	-	-	-	-
1	1	-	-	-	-
-	-	-	-	-	1
-	-	2	-	2	1

THE FINANCIAL COMMUNITY'S USE OF INDICATORS

John Berenyi*

In planning and carrying out financial transactions, higher education institutions would be well advised to recognize and respond to the analytical needs of various financial organizations. This discussion is intended to give an overview of the decision-making environment that currently prevails in the financial community.

The indicators of the financial condition of academic institutions used by the financial community in making investment and economic decisions have a number of clear objectives. These objectives range from determining the financial condition-credit quality connected with short-term and long-term money requirements and structuring arrangements for asset-based financing to formulating decisions in specialized areas such as leasing and insurance underwriting.

Short-Term Debt

The short-term financing activities of educational and other institutions can be divided into two categories. The first category involves those financial needs of institutions which are seasonal, sometimes nonrecurring in character, and frequently of 60-120 days in duration. These short-term needs can be met from internal reserves established for such purposes or through access to a standby bank loan or other credit facility. If these shortfalls are met from internal resources, the institution should assume a realistic investment rate (opportunity cost) for the funds held in reserve. If the cash needs are met from external sources, the banking or other financial institution applies to their own analysis a relatively standard business-analysis approach which takes into consideration the borrower's credit standing, the certainty of cash availability, historical evidence of repayment record, and other such factors.

The second category of short-term debt is issued by educational institutions in anticipation of long-term debt for their capital projects. Unless 100 percent long-term financing is arranged (as is customary in many tax-exempt bond offerings for universities, dormitories, and other purposes), institutions have to rely on conventional construction-loan financing methods. Generally, construction-loan lenders are interested in the availability of a "take-out" in the form of a permanent first mortgage, tax-exempt or taxable bond issue. The appraised value (obtained through two independent appraisals) and the economic and financial viability of the facility all contribute to the decision-making process connected with establishing the proper loan-to-value ratio and other lending criteria. These measures influence the level of funds that financial organizations are willing to allocate for a project.

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* Mr. Berenyi, an investment banker, is with the Public Finance Department of L. F. Rothchild, Unterberg, Towbin, New York.

Long-Term Debt

On the long-term debt side of the ledger, financial analysts and investment managers in banks, insurance companies, and other funding sources are interested in the quality of the secured transactions. In addition to using many of the same indicators and decision-making tools as short-term lenders, holders of long-term securities conduct in-depth analyses of the types of pledges established to assure stability in operations as well as of debt-service payments through the life of the debt issue. Debt instruments which carry several layers of debt-service protection (such as tuition payments, unrestricted endowments on top of rental income from the project, and capitalized debt-service reserve funds) carry a lower interest rate than issues lacking these protections.

In assessing the risks and quality of financial arrangements offered by colleges and universities, members of the financial community recognize the importance of building comparative data sets. Differences among institutions with respect to their legal powers, structural arrangements, and functionl capabilities are clarified in such an undertaking. For example, a higher education institution with several campuses and a number of graduate and professional schools must be compared with other institutions having the same characteristics. Similarly, the financial standing of a private liberal arts college can be determined only by comparison with other colleges of roughly the same structure. Many of these comparative indicators may have early origins in the academic disciplines of comparative economics and public finance, education, and law.*

Specialized Areas

In specialized financial areas such as insurance underwriting, the analyst's main concern is to understand the risks associated with the projects or other covered items. The coverage written by property insurers falls into five classes: (1) physical damage or loss, (2) loss of income and extra expenses resulting from physical damage to property, (3) liability, (4) health, and (5) surety.

Since insurance is a process through which risk is transferred, insurers are concerned with the accuracy with which loss can be predicted; that is, they want to know what degree of risk is associated with a particular activity. The degree of risk is measured by the probable variation of actual experience from expected experience. Since insurance costs have been rising dramatically, it is important to understand the concepts of "risk management":

(a) Risk may be reduced.
(b) Risk may be retained.
(c) Hazard may be reduced.
(d) Loss may be reduced.
(e) Risk and consequently loss may be transferred.

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* See Appendix A for "Financial Indicators of College and University Ability to Support Debt Issues."

The better the control that colleges and universities have on these factors, the lower is the risk premium they will pay for commercial insurance. Some institutions have internalized these costs through "self insurance"; this policy alternative may be realistic for some sectors of the higher education industry. By taking on the probability of this additional burden, however, institutions may incure additional contingent liabilities which usually affect their credit standing.

The other specialized financial area which is relevant to higher education institutions - especially those with hospitals and medical schools - is that of leasing. The leasing contracts are usually written on certain interest-rate expectations, and when the costs of the leasor's funds rise unexpectedly, the profits can be sharply reduced. In measuring their own exposure, the lessors are concerned with the possibility of loss by direct damage to equipment as well as by third-party liability as equipment owner. To minimize such risks, the leasees are usually required to insure property for its replacement cost. With the asset owner as payee, some lease transactions contain indemnification clauses. In addition, the financial condition of the potential leasee is very carefully analyzed, since lease obligations may be disaffirmed in the event of bankruptcy, leased facilities not being considered assets of the leasee.

It is hoped that these remarks will help academic administrators to understand the considerations that prevail in the financial community when the complex negotiations surrounding financial transactions are taking place.

Appendix A
Financial Indicators of College and University Ability to Support Debt Issues

A variety of measures of financial condition of colleges and universities used in the capital markets and by bond rating agencies is of interest to higher educational policy-makers. The following set of indicators usually applies.

Operating ratio: operating and maintenance expenses divided by total operating revenues.

Interest coverage: interest for the year divided into net revenues available for debt service.

Debt service coverage: principal plus interest requirement for year divided into net revenues available for debt service.

Debt service safety margin: system gross revenues less operating and maintenance expenses and less current debt service divided by system gross revenues.

Debt ratio: net debt (gross debt as shown on balance sheet less bond principal reserve) divided by sum of net utility plus net working capital.

Net take-down: net revenues (gross revenues less operating and maintenance expenses) divided by system gross revenues.

Average annual debt service coverage: average annual debt service (the approximate annual amount required to pay interest and to amortize the bonds over the period to stated final maturity) for year divided into net revenues available for debt service.

Interest safety margin: gross revenues less operating and maintenance expenses and less current interest for year divided by system gross revenues.

Months interest, primary reserve: number of months interest at present level could be paid out of moneys in bond reserve fund or bond reserve account; other reserves or money in bond interest accounts not included. Computed by dividing bond interest for the last month of the twelve-month period under review into the bond reserve account amount.

The above measures are general for "revenue bonds" and they are usually modified for various revenue producing facilities. For example, in the higher education sector such considerations as debt per student, endowment per student, ratio of applications to acceptances, enrollment trends, tuition levels in contrast to industry norms are used by professional financial and bond analysts.

Moody's, the bond rating agency, has calculated medians for electric, water, sewer, airport, turnpikes and bridge, tunnel and expressway facilities. They have also developed these measures for hospitals and health-related facilities. While these calculations have not been done for higher education bonds, indications are that they will do so in the future. Available medians appear below.

Current Municipal Enterprise Medians

Following are median values of several significant ratios for the type of enterprise shown. Data cover the period generally 1973-74 so as to represent fairly the industry averages. Figures in parentheses represent the number of situations included in each industry computation. These data should be used comparatively in the appropriate enterprise revenue bond analysis.

	Electric (65)	Water (68)	Sewer (19)	Airport (19)
Operating ratio (%)	57.50	49.20	39.60	44.30
Interest coverage (x)	3.25	3.49	3.61	2.40
Debt service coverage (x)	2.31	2.20	1.81	1.60
D.S. safety margin (%)	21.70	26.50	22.80	22.00
Debt ratio (%)	65.50	40.00	23.90	46.70
Net take-down (%)	47.25	52.50	55.10	60.20

	Turnpikes (18)	Bridge, Tunnel Expressway (22)
Net take-down (%)	75.80	76.30
Interest coverage (x)	3.41	2.14
Avg. annual debt sv. coverage (x)	1.78	1.50
Int. safety margin (%)	52.40	39.20
Mos. int. primary reserve (mo.)	24.00	18.00

Source: Moody's Investment Service

Current Hospital Enterprise Medians

The following represents the medians calculated on hospital enterprises which have been rated by Moody's to date. The medians (averages) convey various measures of performance and earning capabilities of hospitals which have used tax-exempt bonds for their capital financing programs. A total of 75 individual hospital enterprises are covered by the medians. The medians consist

of those which represent ratios and indices common to revenue-producing enterprises, as well as several which are unique to health care enterprises. The current medians are as follows:

	Median
Operating ratio (%)	93.10
Net take-down	8.80
Peak debt service coverage by historical net revenue	0.94x
Peak debt service coverage by estimated net revenues in first full year after project completion	1.77x
Bed occupancy (%)	81.40
Debt per bed	$30,023.00
Number of beds	263.00

ACCOUNTING PRACTICE AND ITS IMPLICATIONS FOR FINANCIAL ANALYSIS

William M. Wilkinson
University of Rochester

In all accounting and financial reporting, the question is: How did we do? Many businessmen--trustees and supporters of higher education--wonder why colleges and universities do not have as good financial data as businesses have. The answer is that they do; their data are just as suspect! The American Council on Education, the National Center for Education Statistics, and other agencies and associations are currently engaged in building data bases, developing formulae, and constructing elaborate computer models that will allow them to study and to draw conclusions from the financial data of academic institutions. Ironically, however, the American Institute of Certified Public Accountants (AICPA) and the Financial Accounting Standards Board (FASB) have just started to conduct major projects designed to determine what the accounting principles behind such data should be; they are only now getting around to asking such fundamental questions as: What is meant by earnings? How should assets be valued? What are the purposes of financial statements? Who reads them? How?

Colleges and universities sell services and receive support. The problem is the everlasting confusion about which is which. Colleges and universities have joint products; they also have joint funding. That is, they have multiple purposes and multiple sources of funds--a satisfactory enough situation until single-minded supporters or customers start wanting information about separate costs and accountability. Exhibits A through C are samples of the consolidated balance sheets and changes in fund balance statements which I have been using at the University of Rochester for some years and which have drawn a favorable response from the trustees. They focus on where the money comes from, where it goes, and how much is left--matters which seem to me to constitute the basis of all financial reporting.

The flow-of-funds statement attempts to avoid some of the confusions of fund accounting. The basic concept in fund accounting is that of restricted versus unrestricted funds; yet that concept is also the cause of most obfuscation in the financial reports of nonprofit institutions.1/ The term restricted funds is too often a matter of individual definition to constitute a sound basis for comparable reporting and analysis. It is confusing even to those who should know

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1/ For a fuller discussion of this point, see: "The Fiction of 'Restricted' Funds in Institutional Accounting" by William M. Wilkinson, NACUBO Business Officer, September 1976

better: who should know whether the restriction applies to how the money can be spent, what it can be spent for, or both, as well as to who can do the restricting. Higher education institutions budget and spend many so-called restricted funds as if they were unrestricted, and many unrestricted funds as if they were restricted. As time passes by, and as the donors and interested heirs pass on, restricted funds tend to be increasingly regarded as unrestricted. The beneficiary institutions are often torn between heeding precatory wishes or only acknowledging the mandatory directions of the donor; and the difference is often some trustee's, administrator's, lawyer's, or accountant's opinion based upon the circumstances of the moment.

According to accrual accounting principles, truly restricted funds should be treated as deferred revenues because, like any other advance payment for specific goods or services, they are a liability until the obligation has been fulfilled, at which time they become like any other earned revenues. Traditionally, however, restricted monies are treated as fund balances--as if they were working capital belonging to the institution--but not accounted for until they are considered spent. This treatment is one of the most irrational and confusing aspects of fund accounting.

The significant question about restricted funds is their separate accountability. One must ask not only whether they are spent for the specified purpose but also whether they are required to be spent in addition to any unrestricted funds that are already going for the same purpose or can be used in place of such funds. To illustrate: A donor gives the university "restricted" funds to support a professorship in biology. If the institution already has several biology professors, it may establish a donor-named chair for one of them rather than hiring another biology professor to occupy the chair. In that way, it can take in the restricted funds without spending much more money, thereby releasing other funds for expenditure elsewhere. In effect, restricted funds given under these conditions have the same advantage as if the donor had given unrestricted funds. On the other hand, the donor may specify that, to be eligible for the gift, the university must hire an additional biology professor. When such a restriction is imposed, the funds are really an advance on services to be rendered and thus can more properly be regarded as deferred revenues, representing a liability until the specified services have been delivered. Such "restricted" funds are questionable "gifts"--however reported by the Development Office--in that they require as much or more money to be spent and thus may leave the institution financially worse off than it was before.

The accounting bible, CUBA '74 2/ says that government appropriations for broad categories of activities or for separate colleges and branch institutions should be classified as unrestricted current funds. What about gifts for broad categories of activities or for branch institutions in the private sector of higher education? Our auditors insist that, at the University of Rochester, appropriations or gifts for scholarships, the Medical School, or the Eastman School of Music be classified as restricted, no matter how much money is already being spent for these purposes. In budgeting and internal accounting, however, we often treat such funds as unrestricted, and then go through a meaningless charade of reclassifying for audit at the end of each year.

It could be argued that, when the institution has spent as much or more money for the purposes for which the restricted funds or deferred revenues are given, the fund or deferred account should be eliminated. Any excess flowing from these earned revenues would then be regarded as unrestricted since the delivery obligations have been met. Therefore, having any such item as restricted funds should be considered specious accounting: If such funds must be spent for specific goods or services, they are deferred revenues; if they can be freely substituted for unrestricted funds in the ongoing support of the institution, then the question of which funds are to be spent first and which are to remain is decided at the discretion of the management, and any pretense of donor restriction on the remaining funds is a sham and a delusion. When AICPA's special task force on accounting principles for nonprofit institutions recommended this concept, however, the outraged cries of college and university business officers could be heard from one end of the country to the other!

Though I have tried to promote the concept of expendable and nonexpendable funds--a much more meaningful distinction than that of restricted and unrestricted funds--it has not sold. People don't want to change.

Much has been said at this conference about financial measures, ratios, formulae, and applications of statistical theory to college and university data; but these data are not worthy of such higher mathematics. The published financial data of academic institutions are not reliable, much less comparable from one institution to another or even from one time period to another in the same institution. Until accounting principles for nonprofit organizations (including colleges and universities) can be agreed upon, until some consensus is reached on definitions and formats, any statistical analysis based on present figures is merely an exercise, and possibly an exercise that is more damaging than helpful.

2/ College and University Business Administration, 3rd ed. (Washington: National Association of College and University Business Officers, 1974).

If the AICPA and the FASB have not yet agreed on such principles, why should those of us in higher education be fooling around with statistics based on financial data which are presumably without principles?

College and university business officers swear by the fundamentals of accrual accounting, yet in their accrual accounting they make a very inadequate attempt to match revenues and expenditures within any one period, rationalizing this deficiency as not wanting to appear "commercial." Depreciation--a key ingredient in accrual accounting--is ignored. They do not accrue investment income or pledges. They do not accrue vacation, sick leave, or other liabilities.

College and university business officers also swear by the fundamentals of fund accounting, yet they combine unlike funds: endowment with "funds-functioning-as-endowment," plant funds with "current" funds (which have conveniently been "transferred" to plant). My consolidated "businessman's" statement has been criticized for combining unlike assets and unlike funds; this criticism hurts, especially when it comes from college financial officers who for years have been combining current and endowment funds! These same financial officers object to the AICPA's Discussion Draft proposing accounting principles for nonprofits on the grounds that it interferes with their own autonomy. Preoccupation with the spirit of academic freedom and with diversity in higher education has been allowed to govern published financial figures to the extent that comparisons become meaningless.

The AICPA has recommended that the financial statements of nonprofits clearly identify the excess of revenues and support over expenses for a given period. After all, the Harvard alumni magazine talks about the University's being "in the black," and many other nonprofit organizations talk about having surpluses or deficits. But in none of the accounting literature or reporting formats is there a clear definition of what constitutes a surplus or a deficit in higher education. College business officers condemn the AICPA for implying any such crass commercial concept as a "profit"--much less a "loss"--to higher education institutions. They want to use their own calculations so that they can come out as they desire. They cannot agree on the definition of a bottom line, yet all colleges and universities have them. Woe betide anyone who tried to make comparisons, or even sense, out of such bottom lines.

Even the term "nonprofit" is a problem. What does it mean? Certainly it does not mean that higher education institutions do not take in more than they spend. How did Harvard get to be worth $1.5 billion? How did the University of Rochester get $200 million in funds-functioning-as-endowment? How could higher education institutions survive if they did not take in more than they spent? What "nonprofit" really means is that there are no stockholders, no individual owners to reap the rewards of anything called profit. (There are intangible rewards, yes, but no monetary dividends.)

A nonprofit institution thinks that it has to show that it breaks even. How does it show this? Very carefully. To show a profit is to encourage the idea that the institution does not need any support; to show a loss is to encourage the idea that the institution does not deserve any support. So the institution makes or loses a few dollars "for show," transferring funds in and out in order to get the result it wants.

College and university business officers responded unfavorably to the AICPA's Discussion Draft on accounting principles for nonprofit organizations. Some typical comments were:

> We are different.
>
> We are big enough to be considered separate, to have our own set of accounting principles.
>
> Certain [principles] might apply, but they have not been adequately tested yet.
>
> Successful institutions rarely have more than a small surplus--thus [the principles] are of doubtful value.
>
> A preponderance of the opinion is that totals are not useful and may be misleading.
>
> Reporting depreciation expense is possible but could lead to [the] erroneous conclusion that current revenues are covering this expense.
>
> Total columns [merging] information which is not homogeneous [are] not proper.

(This last comment from people who have been merging endowment and non-endowment funds for years!) Fewer than half of the college and university reports conform to the 1974 guidelines agreed upon by their own financial officers.

As for financial indicators, the National Center for Higher Education Management Systems once tried to apply business financial analysis to fund accounting statements; the result was disaster. Nonprofit financial analysis can be applied to fund accounting statements, and business financial analysis can be applied to consolidated businessman's statements for nonprofit institutions. For example, many things can be done with the consolidated balance sheet and the flow-of-funds statements (Exhibits A through C): Working capital ratios can be worked out, debts to assets or equity (fund balance) ratios can be worked out, liquidity analyses can be done, and so forth. But for comparability, there must be agreement on what is consolidated, what is included in each term, and how each is used in the formula.

Different kinds of financial data are needed by different levels of management and in different areas of support. It is not a matter of "one size fits all." The trustees and the management are responsible for assuring that resources are effectively used to provide the best possible institutional service. The great dilemma facing them is whether to spend for today or to save for tomorrow. The budget becomes a four-way tug-of-war, with trustees, faculty, administration, and students pulling in different directions. Each group suspects that higher education costs too much, but no one can prove it.

Higher education's jointly produced, intangible, and perhaps invaluable outputs defy quantification. To make up for this, we try to quantify inputs, but this process is just as difficult because inputs are also joint and often intangible and immeasurable. The Chiles Bill recently passed into law after two years of debate aimed at getting agreement that all government spending is either for procurement or for assistance, so that two sets of rules and accountability would cover all cases. Inevitably, colleges and universities insisted on something in between. And they got it: "cooperative agreements," whereby the government agency remains less involved than in procurement but more involved than in assistance. The dividing line between government involvement and government interference is going to be difficult to draw.

I am concerned with what you are going to do with costs and other financial data in higher education. There have been as many abuses as uses of costs. If it turns out that some programs or institutions are "high cost" and others "low cost," what does this mean? The important question is: What are their outputs? What are they doing for that money? And there are no rational, agreed-upon measures of that. When the institution or the government finds out which programs or schools cost more, what should be their response be? Is the government committed to helping those in distress, or should it focus on strengthening further those which are strong? Are colleges and universities immune to the natural laws of birth and death? The proliferation of new colleges and universities in the booming sixties caused little concern; but the possible demise of a few institutions in the seventies has created widespread anxiety. What is the government supposed to do with all the statistics that will come out of the project that is the focus of this conference?

Accounting is an art, not an exact science. Running a college or university is even more of an art and less of a science. Data banks and the statistics drawn from them are subject to the same "garbage in-garbage out" formula as computers are. The outcome of the work at this conference will be only as good as the figures going in. The potential for abuse is staggering. We must continue to put our faith not in the numbers but in the judgments of university presidents, deans, business officers, and trustees.

EXHIBIT A

University of Rochester
Flow-of-Funds Summary
Fiscal year ending June 30, 1977

(in millions)

	Current (Operating)	Plant (Fixed)	Endowment, etc. (Invested Capital)	Loan (Student Capital)	Total 1977	Total 1976 (a)
From:						
Customers for specific services	$120.3	-	-	-	120.3	114.7
Sponsors						
for specific purposes	61.3	2.3	.4	.5	64.5	61.6
for general purposes	6.3	-	-	-	6.3	26.1
Investment income	11.0	.8	-	.1	11.9	12.2
Total	198.9	3.1	.4	.6	203.0	214.6
To:						
Current operating expenses	(191.7)	-	-	-	(191.7)	(180.3)
Interest on plant debt	-	(5.2)	-	-	(5.2)	(5.3)
Renewal & replacement expenses	-	(2.1)	-	-	(2.1)	(1.4)
Total	(191.7)	(7.3)	-	-	(199.0)	(187.0)
Net before transfers	7.2	(4.2)	.4	.6	4.0	27.6
Net transfers						
Mandatory	(10.7)	10.7	-	-		
Nonmandatory	1.8	4.5	(6.4)	.1		
Net after transfers	(1.7)	11.0	(6.0)	.7	4.0	27.6
Net change in capital stated value	-	(1.8)	(56.0)	(.3)	(58.1)	1.7
Net change in fund balances	(1.7)	9.2	(62.0)	.4	(54.1)	29.3
Beginning fund balances	11.4 (b)	223.9	364.8	6.7	606.8 (b)	577.5 (b)
Ending fund balances	$ 9.7 (b)	233.1	302.8	7.1	552.7 (b)	606.8 (b)

(a) Including Hutchison bequest of $25 million.
(b) Before Laser Fusion direct expense deficit, $6.3 million in 1977, $2.9 million in 1976.

EXHIBIT 3
University of Rochester
Consolidated Balance Sheet
June 30, 1977

(in thousands)

	Total 1977	Increase (Decrease) from 1976
ASSETS		
Current:		
Cash (including time deposits of $11,819)	$ 14,092	(321)
Temporary investments	9,932	(283)
Accounts receivable	23,290	(656)
Inventories, prepaid expenses and deferred charges	2,588	(617)
Total current	49,902	(1,877)
Investment:		
Notes receivable	7,079	455
Marketable securities (at market)	305,115	(64,271)
Total investment	312,194	(63,816)
Fixed:		
University plant (at undepreciated book value)	311,834	12,705
TOTAL ASSETS	$673,930	(52,988)
LIABILITIES		
Current:		
Accounts payable and accruals	$ 10,647	1,240
Notes payable	11,259	(1,744)
Current portion of long term debt	2,685	(194)
Deferred revenues	1,749	17
Total current	26,340	(681)
Long term debt (net of current portion):		
Notes payable	9,166	6,727
Contract payable	2,983	(34)
Mortgages payable	-	(23)
Principal of leaseholds payable	80,060	(1,345)
Bonds payable	8,973	(242)
Total long term debt	101,182	5,083
TOTAL LIABILITIES	$127,522	4,402
FUND BALANCES		
Current:		
Restricted	$ 7,219	304
Unrestricted	(3,325)	(5,313)
Loan	7,080	382
Endowment and similar	302,795	(61,995)
Plant:		
Unexpended	24,450	1,287
Invested in University Plant	208,689	7,950
TOTAL FUND BALANCES	$546,408	(57,390)
TOTAL LIABILITIES AND FUND BALANCES	$673,930	(52,988)

EXHIBIT C

University of Rochester
Fund Balances
Year Ended June 30

(in thousands)

	1977	1976	1975	1974	1973	1968
Current unrestricted	$ (3,825)	1,493	2,042	3,503	31	5,873
Current restricted	7,219	6,915	6,900	7,254	6,132	8,453
Total current	3,394	8,408	8,942	10,757	6,163	14,326
Loan	7,080	6,698	6,219	5,627	5,069	2,731
Endowment and similar at market value:*						
Endowment	79,632	96,270	97,939	103,591	141,300	111,609
Funds functioning as endowment:						
Restricted	106,041	126,952	130,013	133,982	183,733	151,190
Unrestricted	113,574	137,699	119,506	125,395	168,137	133,400
Annuity and life income	3,528	3,869	3,660	3,179	3,253	3,152
Total endowment and similar*	302,795	364,790	351,118	366,547	496,975	399,351
Plant at undepreciated book value	233,139	223,902	210,087	202,657	192,315	115,908
Total fund balances, June 30*	$546,408	603,798	576,366	585,688	700,522	532,366
*if at cost value						
Total endowment and similar	222,311	228,915	206,437	225,049	228,732	172,143
Total fund balances, June 30	$466,124	467,923	431,685	444,090	432,279	305,158

Nathan Dickmeyer gave a presentation to the conference on the Stanford TRADES Model. The following article, reprinted from the NACUBO Business Officer, March 1978, is a comprehensive description of the model and its uses.

TRADES: A Model for Interactive Financial Planning

by NATHAN DICKMEYER, DAVID S. P. HOPKINS, and WILLIAM F. MASSY

"Can we keep tuition increases down and still give our faculty the pay raises they deserve?" "If utility prices continue to rise can we still allocate a portion of our budget to new programs?" These financial planning questions and others like them have motivated administrators at Stanford University to seek the assistance of a computer model called TRADES to forecast university expenses and income. TRADES is driven by several forecasting submodels each of which is dependent on the values of a set of Primary Planning Variables (PPVs) controlled by the model user. Because the model readily displays the financial impact of trade-offs between PPVs (e.g., how much must faculty salary increases go down if tuition increases are reduced?), the user is able to assess the effect of these trade-offs and can test tactical decisions more easily. This paper describes the TRADES model and its use at Stanford. "TRADES" is a convenience term for "Trade-offs."

TRADES as a Forecast Model

In its most detailed Stanford version, TRADES can display fifty income, expense, and asset categories projected for up to twenty-five years (see Figure One). TRADES also allows the selection of printouts less detailed than the one shown in Figure One.

Submodels. Forecasts of income, expense, and asset items are built from financial submodels which vary in their level of complexity. The simplest of these submodels applies growth rates to project a particular line item such as the one labelled "Equipment" in Figure One. Step functions are also possible with TRADES. At a level of complexity above this, some items are forecast with a growth rate which is derived from other items in the budget. For example, Stanford has targeted certain gift flows at a rate of increase equivalent to the salary and benefit rate of increase. TRADES derives the salary and benefit rate of increase in order to create this gift income forecast. Still other items, such as faculty salaries, library acquisitions, and tuition income, are expressed inside the model as the product of an underlying physical variable and its unit cost or price, each of which may have its own associated growth rate.

More complex submodels are based on careful studies of specific financial sectors which have revealed important interrelationships among the variables. For example, Stanford's recovery of indirect costs allocated to sponsored research has been the subject of such a study. [Massy, W. F., Hopkins, D. S. P., and Curry, J. R., "Indirect Cost Recovery: A Model and a Protocol," Stanford University Academic Planning Office Report No. 76-2 (December 1976).] TRADES forecasts indirect cost recovery as a function of the forecasts of indirect cost pool levels (such as operations and maintenance and indirect departmental administration), cost allocation parameters, and the research fraction of total direct cost.

A second complex submodel is the one used to forecast the undergraduate financial aid budget. This submodel combines predictions of funds from external aid sources, aid endowment performance, size of the student body, and tuition price to come up with projected aid requirements.

A third submodel charts the level of endowments by combining the forecasted effects of gifts, total return from investment, and payouts. Two options exist in TRADES for projecting endowment payout: either one can stipulate a fixed payout rate (percent of beginning market value) in which case surpluses and deficits are calculated, or one can let the model determine what payout is needed to balance the budget in each future year.

Primary Planning Variables. One convenience of TRADES is that administrators may interactively alter variables to create new forecasts and to examine various financial trade-offs. To make variable manipulations easier Stanford has taken a small subset of the approximately 200 working variables and called them Primary Planning Variables.

Stanford University

Stanford, California 94305
Enrollment: 12,640
Control: Independent
Highest Offering: Doctorate

These variables are considered of high importance to the decision maker. These are the variables which a decision maker would be most interested in "playing with." Most of these are true decision variables, such as the number of faculty and the size of the undergraduate student body. Some, however, are often outside the control of administrators but are of such magnitude, impact, and uncertainty (e.g., utility rates) that it is useful to assess their effects at a variety of levels. This kind of sensitivity analysis provides answers to questions such as "What would happen if either our worst or our best utility increase forecasts came true?"

Thus TRADES allows the user to enter new PPV values at any year. These PPVs are of three general types:

- Base values—e.g., numbers of students, numbers of faculty, etc.
- Growth rates—e.g., tuition price increase rate, faculty or staff salary increase rates, etc.

Nathan Dickmeyer is research assistant and David S. P. Hopkins is senior staff associate at Stanford University's Academic Planning Office; William F. Massy is vice president for business and finance at Stanford University.

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Figure One

```
EXPENSES                                                                    FOUR YEAR FORECAST
                                DIFFERENCE
YEAR ENDING          1978.        1.      1979.       1.      1980.        1.      1981.
                     -----       ----     -----      ----     -----       ----     -----
   FACULTY SALARIES  20339.     1591.    21930.     1776.    23706.     2085.    25792.
   OTH TEACHING       1285.      101.     1386.      112.     1498.      132.     1630.
   OTH PERSONNEL     31307.     2479.    33786.     2830.    36616.     3144.    39761.
   TA&S               1722.      106.     1828.      115.     1943.      127.     2070.
   SALARY REQS        1209.      103.     1312.      109.     1421.      121.     1542.
                     -----       ----     -----      ----     -----       ----     -----
     TOTAL SALARY    55861.     4381.    60242.     4943.    65185.     5610.    70795.
     STAFF BENEFITS  12070.     1490.    13561.     1739.    15300.     2007.    17307.
                     -----       ----     -----      ----     -----       ----     -----
   SALARY AND S.B.   67932.     5871.    73803.     6682.    80485.     7617.    88101.
   LIBRARY ACQ.       4132.      683.     4816.      690.     5506.      745.     6251.
   U.G. AID           4764.      478.     5243.      421.     5664.      394.     6058.
   GRAD AID           2716.      191.     2907.      242.     3149.      252.     3401.
   STUD HEALTH        1531.      137.     1668.      155.     1823.      174.     1997.
   BLDG. MAIN         1741.      220.     1960.      230.     2190.      210.     2400.
   UTILITIES          7938.      877.     8815.     1013.     9828.      888.    10716.
   GROUNDS             886.      106.      991.      110.     1102.      104.     1206.
   CUSTODIAL          1731.      226.     1957.      238.     2195.      213.     2408.
   EQUIPMENT           483.       29.      512.       30.      542.       33.      575.
   TRAVEL              875.       62.      936.       64.     1000.       70.     1070.
   E.M. AND S.        8139.      557.     8695.      576.     9271.      634.     9905.
   OTHER              8953.      159.     9112.      587.     9699.      646.    10345.
   CHARGEOUTS        -5555.     -453.    -6008.     -526.    -6534.     -575.    -7108.
                     -----       ----     -----      ----     -----       ----     -----
     TOTAL BUDGET   106265.     9143.   115408.    10514.   125921.    11405.   137326.
                     -----       ----     -----      ----     -----       ----     -----
NEXT YEAR'S F         531.     -185.      346.      283.      630.       57.      687.
                     -----       ----     -----      ----     -----       ----     -----
TRANS TO OP RES (+)   511.       60.      570.     -394.      176.     -630.     -454.
                     -----       ----     -----      ----     -----       ----     -----
=>


 INCOME

YEAR ENDING          1978.        1.      1979.       1.      1980.        1.      1981.
                     -----       ----     -----      ----     -----       ----     -----
   TUITION/FEES      61806.     5181.    66988.     5962.    72949.     6201.    79150.
                     -----       ----     -----      ----     -----       ----     -----
PO FROM UNR. POOL     7095.      777.     7873.      737.     8610.      800.     9409.
PO FROM SPEC. INV.     931.       61.      992.       65.     1057.       70.     1127.
NET AN RNTLS            17.      191.      208.        6.      214.       49.      263.
                     -----       ----     -----      ----     -----       ----     -----
   TOT. UNR PO        8043.     1030.     9073.      809.     9881.      919.    10800.
                     -----       ----     -----      ----     -----       ----     -----
PO FROM RES. POOL     5437.      555.     5992.      600.     6591.      644.     7235.
                         0.       0.        0.        0.        0.        0.        0.
                     -----       ----     -----      ----     -----       ----     -----
   TOT RES. PO        5437.      555.     5992.      600.     6591.      644.     7235.
                     -----       ----     -----      ----     -----       ----     -----
UNREST GIFTS          2317.      139.     2456.      147.     2603.      156.     2759.
OVHD N GVT GNT         278.       10.      288.       10.      298.       10.      308.
                     -----       ----     -----      ----     -----       ----     -----
   TOT UNREST GIFTS   2595.      149.     2744.      157.     2901.      166.     3067.
   REST GIFTS         1676.      145.     1821.      163.     1984.      192.     2176.
   SPEC. FUNDS         812.       70.      883.       79.      962.       93.     1054.
EXP FUNDS POOL        3181.      275.     3455.      316.     3771.      342.     4113.
SRI                   1129.       45.     1175.       47.     1222.       49.     1270.
SEC LOANS              110.        0.      110.        0.      110.        0.      110.
OTHER                 1000.       60.     1060.       64.     1124.       67.     1192.
                     -----       ----     -----      ----     -----       ----     -----
   OTHER INCOME       5420.      380.     5800.      426.     6227.      459.     6685.
                     -----       ----     -----      ----     -----       ----     -----
   REIMB IND COSTS   22213.     1849.    24062.     2094.    26155.     2286.    28441.
   TRF TO PLANT      -1965.     -157.    -2122.     -170.    -2292.     -183.    -2476.
   ABF SCHOOLS         439.        0.      439.        0.      439.        0.      439.
   INC. IMPROV.        300.        0.      300.        0.      300.        0.      300.
                     -----       ----     -----      ----     -----       ----     -----
     TOTAL INCOME    106775.     9202.   115978.    10120.   126097.    10775.   136873.
                     -----       ----     -----      ----     -----       ----     -----
TOTAL OPERATING RES.   2420.      511.     2930.      570.     3500.      176.     3677.
 OPTION? (TYPE 11 TO VIEW THE LIST.)
=>
```

Note: The figures in all examples are derived wholly from fictional data.

Note: Schools of Business and Medicine, Hoover Research Institute, and all auxiliary services are excluded.

[An explanation of abbreviations appears on page 24.]

○ Coefficients—e.g., the percentage of faculty who are tenured, the percentage of budget dedicated to new, incremental programs, etc.

The Relationship of PPVs and the Submodels. In general, the PPVs drive the submodels. That is, once a variable is declared a decision variable, its level is set (or left at some default value) only by the user. It is not calculated by a forecasting submodel. However, the decision maker is free to decide on the mode preferred for some variables. Switches are used to change a variable from decision mode to submodel mode. For example, a switch can be set so that the user is placed in control of the endowment payout rate. Endowment payout would thus be declared a decision variable. Or the switch can be set to cause a submodel to calculate the payout rate according to a formula. One possible formula calculates the rate such that the budget deficit remains at zero.

Not every variable can be allowed to be a decision variable, however. The cognitive strain on the user would be too great. Many variables are assumed to be set by policy in terms of dollars per a particular PPV level. Thus each PPV change induces a series of marginal cost and income changes. For example, an increase in the number of faculty positions increases fringe benefit costs, the number of academic support staff, and also variable nonsalary costs. Faculty members also participate in indirect departmental administration, a portion of which is recoverable from sponsored research. Thus an increase in faculty positions increases indirect cost recovery income. "Driven" variables like nonsalary costs per faculty FTE are not part of the PPV set but are used to assess the financial impact of decisions on PPV changes. An increase in the decision variable, faculty FTE, automatically causes nonsalary costs to increase. It should be noted that even these "driven" variables can be moved to the PPV set should the decision maker wish to do sensitivity analyses on them. A decision maker may find it useful to test the effect of a 10 percent increase in variable nonsalary costs per faculty FTE, for example.

Financial Trade-Offs

A discussion of trade-offs must begin with an examination of the constraints which force such measures. The most obvious constraint is budget balance: expenses equal revenues. With TRADES, Stanford administrators have also sought to implement some more dynamic constraint concepts [for more details of the equilibrium concept as it applies to universities, see Hopkins, D. S. P., and Massy, W. F., "A Model for Planning the Transition to Equilibrium of a University Budget," *Management Science*, Volume 24, No. 11, (July 1977), pp. 1161-1168; Massy, W. F., "A Dynamic Equilibrium Model of University Budget Planning," *Management Science*, Volume 23, Number 3 (November 1976), pp. 248-256.] One dynamic constraint is that the growth rate of expenses should not exceed the growth rate of income items. This is an important concept since many of the Primary Planning Variables are indeed growth rates.

Table One: Primary Planning Variables

Base Values

1.	FAC	Full-time equivalent regular faculty members, i.e., professors
2.	UG	Head-count of undergraduate students registered for autumn quarter
3.	GR	Head-count of graduate students registered for autumn quarter

Growth Rates[1]

4.	DT	Annual real growth in tuition price
5.	DFS	Annual real growth in faculty salaries
6.	DSS	Annual real growth in staff salaries
7.	DUT	Annual real growth in per unit utilities costs
8.	DSBT	Annual real growth in staff benefit costs which vary directly with faculty or staff FTE

Coefficients

9.	TENR	Ratio of FTE tenured faculty to total FTE regular faculty
10.	STFR	Ratio of FTE academic support staff to regular faculty
11.	P	Stipulated endowment payout ratio as a percentage of year beginning market value
12.	F	Budget enrichment factor as a fraction of the preceding year's total budget

[1] Real growth is the percentage increase above inflation.

Explanation of Obscure Abbreviations

Abbreviation	*Full Listing*
OTH TEACHING	Other teaching faculty
OTH PERSONNEL	Other nonfaculty personnel
TA's	Teaching assistants
SALARY REQS	Salary requisitions
SALARY AND S.B.	Salary and staff benefits
LIBRARY ACQ	Library acquisitions
U.G. AID	Operating budget undergraduate financial aid
GRAD AID	Operating budget graduate financial aid
BLDG MAIN	Building maintenance
E.M. AND S.	Expendable materials and supplies
NEXT YEAR'S F	Budget enrichment dollars. Total amount of incremental new program expense included in next year's budget.
TRANS TO OP RES	Transfer to operating reserve, i.e., surplus/deficit
PO FROM UNR POOL	Payout from unrestricted endowment
PO FROM SPEC. INV.	Payout from specific investments
NET AN RNTLS	Net annual rentals
TOT. UNR PO	Total unrestricted payout
PO FROM RES. POOL	Payout from restricted endowment
UNREST GIFTS	Unrestricted gifts
OVHD N GVT GNT	Overhead recovery on nongovernment grants
REST GIFTS	Restricted gifts
SPEC. FUNDS	Special funds
EXP FUNDS POOL	Interest on expendable funds pool
SEC LOANS	Interest on security loans
REIMB IND COSTS	Reimbursed indirect costs
TRF TO PLANT	Transfer to plant
ABF SCHOOLS	Net income from medical//business schools
INC. IMPROVEMENT	Income improvement

Thus, at Stanford it is specified that in order for a configuration of variables to be acceptable (to borrow from optimization model terminology, this state will be called "feasible" from now on), it must result in budget balance in the first year and in at least one future year as well.

For the sake of efficiency the tendency has been to specify equilibrium for a small number of years. For example, a first-order equilibrium constraint specifies that the budget should be balanced in the base year and one year into the future (or if a surplus occurs in the base year, then there should be at least the same size surplus generated in the next year). Although this does not guarantee a balanced budget ten years hence, it has been found that by controlling the growth rates to achieve first-order equilibrium, enough of a balance has been created to guarantee that future problems will be manageable.

The TRADES model also allows flexible constraint design. Up to fifth-order equilibrium could be specified if so desired. Another interesting constraint is a version of stationary equilibrium which forces a sort of inter-generational equity. That is, the fraction of the budget that is supported by tuition could be restricted to its present level. This would mean that future students would not have a greater burden for financing the university than present students. Another version of stationary equilibrium would freeze the fraction of the budget supported by endowment. Other constraints are possible. One might specify that benefits be allowed to grow to no more than a certain percentage of salaries. Or a limit could be placed on the student/faculty ratio.

Constraints also have a geometric interpretation. In considering all the possible combinations of three PPVs, it should be noted that some of those combinations are feasible with reference to a certain set of constraints. The feasible solutions form a region with the constraints as boundaries and the changing PPV levels as the three dimensions. If one is using sixteen PPVs the same is true, but one must then somehow imagine a sixteen-dimensional space. It is more practical to imagine a two-dimensional slice through the feasible space. This picture would show the feasible trade-offs between a given pair of variables along whatever boundaries (constraints) restrict them.

Option 5 of TRADES allows such a view of two-dimensional slices through feasibility space. Figure two is a graph of the real growth rate of tuition (DT) against the budget enrichment fraction (F) (the fraction of the previous year's budget used to fund incremental programs and improvements). This graph allows the decision maker to evaluate the possibilities of using one variable to improve the setting of a higher priority variable. The decision maker can note the location of the present configuration on this graph and can see how far it is from boundaries. Note that the slope of the boundary is given in the display. The decision-maker can see that a 1 percent increase in DT would allow a 0.5 percent increase in F. This information facilitates trade-offs. At that rate of exchange, the decision maker may ask, "Would I be willing to raise tuition 1 percent in order to achieve a 0.5 percent increase in the budget enrichment fraction?" The model does not solve the problem for him, but it does allow the user to ask trade-off questions in terms of financially equivalent units for the variables in the trade.

Other ways of examining the feasibility space are provided. One of these is a variable by variable test. By how much must each variable be changed if it alone is used to find the feasible boundary? If the configuration is already feasible, this distance is called the variable's slack. If it is infeasible, it is called the variable's violation.

Option 2 of TRADES lists these variables by variable distances from the feasibility boundary. In figure three, the configuration is infeasible because of the high growth of expenses compared to income. A solution to the problem in figure three is to increase real growth rate of tuition by .013,

Figure Two

```
      0.0200 *
F            *
      0.0175 *
F            *
      0.0150 *
F            *
      0.0125 *                                                    ++
F            *
      0.0100 *                                              ++    ++
F            *
      0.0075 *                                        ++    ++    ++
F            *
      0.0050 *                                  ++    ++    ++    ++
F            *
      0.0025 *                            ++    ++    ++    ++    ++
F            *
      0.0    *                      ++    ++    ++    ++    ++    ++
F            *
           *****I*****I*****I*****I*****I*****I*****I*****I*****I*****
              0.0         0.0100      0.0200      0.0300      0.0400
                    0.0050      0.0150      0.0250      0.0350
           DT      ++  MEANS POINT IS FEASIBLE (APPROX LINEAR SLOPE   0.50)
 OPTION? (TYPE 11 TO VIEW THE LIST.)
=>
```

eliminating the .013 violation (.023 at the boundary less the .010 in the current configuration). Note that the amount of change for the real growth of tuition would also eliminate the violation for *all* the PPVs since that change would move the configuration as a whole into the feasible region. Table 1 explains the PPV abbreviations.

TRADES can also determine the trade-off values in more than two dimensions. If a set of variables is specified by the user to change in a set ratio (in other words, DT might be set to change upward at half the rate at which F was being changed), the model will show how far the variables can be altered in these ratios before the boundary is reached. It is also possible to set a target for any variable and to examine the trade-offs among the other variables necessary to achieve that value. The trade-offs may be done against any number of the other PPVs to achieve the target.

It is possible to do these trade-offs in any year the user specifies. That is, once the model's base parameters have been well established, it is possible to cycle the model ahead such that the data available to the trade-off routines represents a future state.

Impact of TRADES Upon the Stanford Administration

The Search for Decision Variables. One of the most interesting and continually evolving aspects of TRADES has been the selection of PPVs. While the number of faculty is clearly within the administration's control, it is less clear that the growth in cost of faculty salaries is completely within administration control. These costs may indeed be determined by campus policies regarding a level of excellence and thus by market mechanisms where the market is made up of those other universities striving for a similar level of excellence. Why bother making faculty salary growth a decision variable? Why not just build a submodel which could generate the projected future market effects on this variable? The answers to these questions are similar for all situations where we have debated a variable's level of "decisionability."

○ Even though a policy may exist with regard to the standard of excellence of the university, the policy cannot be upheld in a vacuum. Under certain conditions, an administrator may wish to deviate from what the market seems to demand (especially over the short run) to meet other demands more threatening to the university.

○ In the short run, this rate is absolutely under the administration's control. The setting of this rate historically has been a major budget decision.

○ The market mechanisms are so indistinct that the exact setting necessary to achieve a given level of excellence for this variable is unknown. There is sufficient flexibility in any prediction that the administrator will wish to move the rate around anyway.

To summarize, decision PPVs are generally those where (1) the need to use them in trade-offs exists (either due to the amount of leverage on the budget or the uncertainty surrounding their prediction), (2) where the decision makers are able to exercise control, and (3) where the possible prediction submodel produces results sufficiently uncertain that the decision maker will wish to rely on his own judgment much of the time.

An even more interesting example is the rate of increase of fringe benefits cost. Although this problem has not been completely solved, the issues have become clearer. Can these costs be disaggregated into controllable and noncontrollable portions? Is the need to use them in trade-offs great enough to justify calling them decision variables? Is it possible to buck the labor market when it comes to employee benefits?

One of the side benefits of the TRADES model has been the illumination of "decision opportunities." [Cohen, M. D., and March, J. G., *Leadership and Ambiguity*, New York: McGraw-Hill, 1974.] In at least a few cases, the model has caused administrators to examine areas which were previously unexplored.

The Search for Marginal Costs. Part of submodel development has been the attempt to determine the full budgetary changes caused by changes to single

Figure Three

```
 OPTION? (TYPE 11 TO VIEW THE LIST.)
=>2
 NAME      LIMIT OF DECREASE  CURRENT  LIMIT OF INCREASE
    1 FAC        575.9602       770.0000**************
    2 UG  **************       6450.0000    8068.9453
    3 GR  **************       4400.0000    6723.1953
    4 DT  **************          0.0100       0.0230
    5 DFS         -0.0080          0.0200**************
    6 DSS          0.0020          0.0200**************
    7 DUT         -0.1040          0.0200**************
    8 DSBT        -0.2400          0.0750**************
    9 TENR        -0.1740          0.6000**************
   10 STFR        -0.1240          0.4000**************
   11 P   **************          0.0470**************
   12 F          -0.0015          0.0050**************
 +++ INDICATES A VARIABLE THAT HAS REACHED ITS UPPER OR LOWER BOUND.
 *** INDICATES THAT NO LIMIT EXISTS.
 OPTION? (TYPE 11 TO VIEW THE LIST.)
=>
```

VARIABLE BY VARIABLE BOUNDARY TEST

PPVs. The first rule we have used is that a change in the level of one PPV should not affect the levels of others. One exception has been that whenever the budget enrichment fraction is changed, there is a change in the number of faculty in the following year. Budget enrichment causes a supplemental increase in the number of faculty in the new programs. We do not want the decision maker to be overridden by the model when he tries to set a decision variable.

A second rule is that the calculation of marginal cost and revenue rates should reflect changes directly attributable to the changes in the relevant PPVs. For example, more students mean more financial aid costs, more infirmary costs, and more costs to the registrar; but care was taken not to include all student services costs. Admissions office costs were felt to be proportional to the number of applicants, not the number of students, for example.

Third, if a cost was found to be related to a change in a PPV, its unit cost per PPV was assessed, based on reasonable amounts of change. That is, no attempt was made to determine the impact to registrar costs of adding one more student. This would probably be zero. The average per-student cost was not used because many of the registrar's costs are fixed; e.g. computer programmers. First, an assessment was made of the reasonable amount of change to the relevant PPV which the administration might wish to examine. Then, for example, it was asked if the student body were to increase by this reasonable change, say 200 students, by what amount would the registrar's costs probably go up?

The Creation of Submodels. As decision makers have come to rely on TRADES more, there has been a growing push to refine the submodels. TRADES has spawned several parallel investigations (and nurtured several others which were already in progress). Can the utilities forecasting be improved? What are the major cost components associated with utilities? Are these components likely to have differing rates of consumption change and differing rates of per-unit cost growth?

Stanford is also studying historical fluctuations in its graduate financial aid budget, the levels of charge-outs, and endowment performance.

TRADES has provided a focus for these research projects. Previous studies have provided a series of interesting facts as to why certain portions of a line item may be increasing. But now TRADES asks for a coherent prediction for the entity or entities represented by the line item.

Intellectual Control. Unfortunately, it is all too easy to let a model like this get out of control. After a while, only a small set of specialists knows why it does what it does. Stanford administrators have tried to formulate some guidelines to prevent this situation.

- Budget group members (the provost's top budget advisors) are encouraged to have "hands-on" experience with the model. It is important for the decision makers to know how much control they have over the model. It is important that we listen and try to make changes to overcome the shortcomings they notice.
- Should any user question any number which the model produces, it must be explained and derived by hand, no matter how tedious the process. Some results are counter-intuitive (at least temporarily) due to the number of feedback loops. It has been found very helpful to stop any session and show where the questioned numbers were derived. Occasionally, errors have been found.
- Whenever a forecast is run, a listing is made of what was assumed. Occasionally, we are dissatisfied with the way some number is modeled. If decision makers are shown the modeling assumptions, there is usually feedback as to how else to proceed.
- Involve the specialists. The indirect cost recovery submodel could not have been built without the aid of those who negotiate the recovery rate. Although views of the process differ somewhat, every session together helped to improve understanding.

Maintaining intellectual control is not easy, given ever-increasing opportunities for enhancement and for extension to cover more budget problems. But, in the long run, intellectual control is the *sine qua non* of validity and credibility. Therefore, Stanford is trying to proceed with caution while broadening participation of the university community. Where necessary, administrators are prepared to eschew expansion into complex areas or even to step back to less sophisticated techniques until a greater understanding can be achieved.

A Generalized Version

In conjunction with a pilot implementation of TRADES at several other schools, a version of TRADES called GENTRA (GENeralized TRAdes) has been created, which retains the options of TRADES, but contains a much more basic set of financial routines which is less specific to Stanford than TRADES. Variables like room and board income and state appropriation have been added. An operating manual exists for this program and can be obtained at cost from the Academic Planning Office at Stanford. [Dickmeyer, N. and Hopkins, D.S.P., "GENTRA: *GEN*eralized *TRA*des Model," Academic Planning Office, Stanford University (June 1977).]

Conclusion

It should be emphasized that many of the basic strategies for financial planning were evident before the creation of TRADES. Earlier work with long-range economic models of the university defined acceptable equilibrium configurations in terms of much more aggregate variables. Work with the TRANS (transition to equilibrium) model provided a means for determining the intermediate steps necessary for going from budget disequilibrium to budget equilibrium. Another phase of Stanford research has been the investigation of methods for the direct assessment and optimization of university decision maker preference functions. [Hopkins, D. S. P. Larreche, J., and Massy, W. F., "Constrained Optimization of a University Administrator's Preference Function," *Management Science* (December 1977)] and [Wehrung, D. A., Hopkins, D. S. P., and Massy, W. F., "Interactive Preference Optimization for University Administrators," *Management Science* February 1978.] This research strengthened understanding of primary planning variables and the difficulties which decision makers have in being directed toward optimal feasible university financial configurations. Before developing TRADES, therefore, we had a sense of how to do projections, what characterized a feasible configuration and how more preferred configurations could be devised by trading-off variables. Viewed in this light, the real significance of the TRADES model is that by taking care of all the tedious financial calculations, the model frees the user to focus on his or her value preferences for alternative PPV configurations. ♦

APPLICATIONS OF STATISTICS TO FINANCIAL INDICATOR DEVELOPMENT

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The task of developing measures of financial health for higher education is essentially an exercise in construct definition, where definition is viewed as a process of "specifying meaning" (Kaplan, 1964). Constructs are "deliberate creations chosen to organize experience into general law-like statements" (Cronbach, 1971). The term construct is preferable to concept in that it denotes human invention; the regularities (i.e., patterns of relationship) among financial indicators are discovered, and constructs are invented to explain the observed regularity. Thus, selected indicators which seem to be measuring a common influence (e.g., net worth) are grouped, and indicator scores are combined to best represent the presumed common influence.

Financial health is a super-construct comprising some as-yet-unspecified number of primary constructs. At present not enough is known about the underlying structure of the hundreds of proposed indicators (see Van Alstyne and Coldren, 1976) to inform speculation about either the number of dimensions required to define "financial health" or the structural properties of these dimensions. At the least it is safe to assume that the notion of financial health is multidimensional, and any single linear composite of financial and contextual indicators (see Lupton, Augenblick, and Heyison, 1976) will conceal or distort far more than it reveals.

An often-underrated phase of indicator development having little to do with statistics but much to do with how useful statistics can be, is the conceptual stage. Most statistical approaches to construct definition are quite sensitive to indicator breadth and symmetry. If indicators are haphazardly developed or if they reflect biases, then the resulting constructs will not possess the desired properties discussed below. We will assume throughout the remainder of this paper that the conceptual stage has been successfully negotiated and that a broad set of face-valid indicators is ready for examination.

A construct attempts to represent the essential characteristics of an organizing influence. In this sense a construct is an hypothesis about the nature of some organizing influence, which has determined the relationships holding among a set of indicators. Two generic classes of information are available for testing our hypothesis. The first focuses on characteristics of the relationships among indicators and between indicators and constructs. The second class of information involves relationships between the construct of

interest and other theoretically or practically relevant information (e.g., institutional bankruptcy). The process of organizing the former type of information is termed intrinsic definition, whereas the latter is extrinsic definition. The former is characterized by "prediction of simultaneous appearance," and the latter by "prediction of succession" (Cattell and Coulter, 1966).

Properties of Intrinsically Well-Defined Constructs

Professor G. E. Moore wrote "The most important sense of 'definition' is that in which a definition states what the parts are which invariably compose a certain whole." In intrinsic definition the whole is a construct, its parts are indicators, and the reference to invariability refers to the invariant pattern of indicator covariation. A construct asserts what Braithwaite (1960) calls "a concomitance of properties in the same thing or event" (p. 9). In other words, a construct asserts that certain regularities will obtain in the relationships among indicators.

The task of intrinsic definition is to subject an observed pattern of covariation among indicators to a series of examinations. Among the questions asked are: (1) Is the observed structure essentially univocal: i.e., is there one predominant organizing influence, or are there several? (2) How replicable is the structure: i.e., how many cases (i.e., institutions) does it take to replicate the structure at a given criterion level? (3) How invariant is the structure throughout the score range on the measure? and (4) How stable is the structure over time? Procedures for answering these questions have been developed by Stenner and Katzenmeyer (1976) and will not be elaborated upon here.

Intrinsic definition can proceed without the analyst's making any commitment as to the characteristics of the inferred organizing influence. In fact, a construct measure should undergo extensive intrinsic definition before the process of extrinsic definition begins. If a construct measure withstands the tests of intrinsic definition, then not only is it uninteresting to speculate about the nature of the as-yet-undocumented organizing influence, but also any attempt to attach an interpretation and label will mislead others about what has been discovered. It is the province of extrinsic definition to determine what interpretation and label should be given to the inferred organizing influence.

One of the most important consequences of applying intrinsic definition procedures to the development of financial indicators is that they provide a means for establishing the inferential equivalence of obtained scores. The analyst wants to be in a position of drawing

the same inference from a particular score, whatever an institution's characteristics. Equivalent inferences can be drawn from similar scores for two institutions only after it has been established that the construct measure, in fact, measures the same organizing influence across institutions. If a construct measure taps different organizing influences in private (as opposed to public) institutions, then scores on the construct cannot be compared.

Any number of structure-searching techniques may be useful in establishing the intrinsic definition of a construct; which technique depends in part upon the assumptions one wants to make about the indicator's distributional properties. A strong structure will be discernible with factor analysis, cluster analysis, or some nonmetric technique such as multidimensional scaling or small space analysis. If the assumptions are even weakly met, I would recommend factor analysis, because of the recently available procedures for testing a structure's invariance. Some of the more exotic alternatives, such as small space analysis, have not been applied sufficiently to yield an understanding of the vagaries of the technique.

Properties of Extrinsically Well-Defined Constructs

The process of extrinsic definition generally begins with a content analysis of the indicators composing the construct measure. Content analysis relies on the wisdom, insight, and creativity of the judges to abstract a description of what is common to a set of indicators. Based upon the content analysis, a tentative description of the organizing influence is developed, and a shorthand description in the form of a construct label is selected. These initial steps mark the beginning of the ongoing process called extrinsic definition, which remains sensitive to new relationships between the construct and other variables and which modifies the description and meaning of the organizing influence in keeping with new findings.

In addition to evidence of convergent and discriminant validity, predictive validity is of particular importance in developing financial indicators. The usefulness of a financial health construct depends upon its prognostic and diagnostic properties. A construct measure with good prognostic properties provides a sign of things to come; it acts as an early warning device or forecast. A construct with good diagnostic properties provides insights into what is going wrong, so that corrective action can be initiated. Note that there is little available information on the prognostic and diagnostic properties of financial health constructs. The findings reported in Change a year ago (Lupton, Augenblick, and Heyison, 1976) dealt with the convergence of expert ratings and indicators but did not address directly the issues of diagnosis and prognosis.

Analytic methods for relating financial health constructs to other variables abound. The choice again depends upon the assumptions one is willing to make about the distributions underlying independent and dependent variables. Since regression analysis or its mathematical equivalent, two-group discriminant analysis, have been used most often, a few suggestions regarding the use of these techniques are in order:

- It is generally inappropriate to take a continuous criterion variable (e.g., experts' ratings of financial health) and form two groups incorporating only the extremes of the distribution (i.e., exceptionally healthy vs. exceptionally unhealthy) and then use two-group discriminant analysis rather than regression analysis. The dichotomization procedure costs degrees of freedom and accomplishes nothing in the way of explanatory power or communicability of results.

- Interpreting standardized beta weights or discriminant weights as indicative of the relative importance of a variable as a predictor of a criterion can be highly misleading. In research on financial health indicators, we are not typically interested just in predicting a criterion, but rather in understanding the structure of effects. A new development called commonality analysis partitions the explained variance into unique effects of individual variables and various orders of joint effects. Thus it is possible to examine fully the ways independent variables combine to explain criterion variance.

- Second-order interactions and curvilinear relationships tend to be more prevalent in financial data than in behavioral science data. Some financial health constructs may have optimum levels, such that any departure from this level, whether up or down, represents a loss in financial health. When financial health constructs are used as predictors, care should be taken to investigate potential interactions and curvilinear relationships.

- Analyses based upon the several linear models are sensitive to small samples and the related problem of outliers. Whenever small samples are used, the residual plots should be carefully scrutinized and some form of jackknife cross-validation method should be employed.

In conclusion, this paper has focused on the logical/statistical issues surrounding the development of financial health constructs, rather than issues surrounding their use in policy formulation.

Therefore, the presentation has ignored such otherwise important topics as trend analysis, the pathbreaking work of Rene Thom called "Catastrophe Theory," and outlier analysis; all of these are promising analytic alternatives, once constructs have been developed and data have been collected. Although the emphasis on construct definition is well placed, it is not too early to begin asking how the constructs will be used to inform policy, how the problems of aggregation (including the family of ecological fallacies) will be solved, and how the institution's need for individual data will be reconciled with the industry's need for aggregate data.

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DESIGNING A RESEARCH PROGRAM TO ACCELERATE INDICATOR DEVELOPMENT AND APPLICATION

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The culmination of this two-day meeting on new developments in measuring financial conditions of colleges and universities would seem an ideal occasion for talking about the design of a research program for the purpose of accelerating the development and application of indicators. In view of the many presentations at this conference that have projected new ideas on the subject, it would be presumptuous of me to come up with a ready-made design. NACUBO very much supports this area of development and has been engaged in specific efforts with ACE's Economics and Finance Unit.

I would urge that, as we design such a research program, we first reassess, reevaluate, and sharply define our goals and our constituencies. I suggest the following questions for consideration:

1. Are our goals to assist in the internal management of institutions?
2. Are our goals to assist at the state level?
3. Are our goals to assist in the development of national policy?

I urge that we sharpen our focus within these three areas. Other efforts in the financial area have run into difficulties because they tried to encompass all three goals simultaneously and thus made less progress than if the target had been more clearly understood and agreed upon.

The Problem of Definition

Even though I have been involved in several efforts related to financial indicators and measures, I have not myself clearly defined--nor have I seen clear definitions of--what financial measures or indicators are.

Any number of what I would consider financial measures are used internally. For example:

Cost per BTU consumed for electricity and power

Cost per meal served

Residence hall occupancy ratio

Energy used per student

Janitor cost per square foot

Administrative salary comparison

Average costs per student.

A recent article by John Tucker, a partner of Peat, Marwick, Mitchell suggested some financial warning signals, such as declining number of admissions applications. Included in the financial area were reviews of the balance sheet for:

Decreasing amount of unrestricted current and quasi-endowment funds

Increasing percentage of receivables to total billings

Increasing amount of total receivables

Increasing reliance on interfund borrowing

Decreasing value of endowment funds per FTE student

Increasing amount of payables.[1/]

At the state level, there has been continuing interest in developing other quantitative measures such as average cost per student, cost per discipline, cost per graduate. NACUBO itself has been engaged in financial measure activities that apply primarily to the institution, such as a Cost Performance Survey on Investments.

The Minter-Bowen Study, together with additional applications by John Minter, indicated that institutions must also be able to compare their financial operations with those of peer institutions.

If design for further work is related to national policy issues, however, the problems are of a different type.

The Search for Indicators

I am concerned, as I have mentioned on previous occasions, that some people would like to find a single indicator to demonstrate the financial health of an individual institution. I am concerned that

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1/ John Tucker, "Coping with the Squeeze of the New Seller's Market, Management Controls, September/October 1977." Peat, Marwick, Mitchell and Company (reprinted in theApril 1978 issue of the NACUBO Business Officer.

some people want the equivalent of a price-earning ratio or of earnings per share. We have much to learn from the industrial models, but it should be cautioned that the reliability of the measures used in industry is a subject of great debate in the financial world. There has been considerable criticism of the accounting practices applied to industry. Many firms have switched from first-in, first-out to last-in, first-out inventory valuation because rapid inflation in the past few years has distorted their earnings through inventory profits.

A representative of First Street Bank of Boston commented to me recently that, in evaluating new institutional customers in higher education, the bank ranks most highly their personal management audit, which is the key to whether the institution will be a sound customer. The balance sheet is of interest but is not as significant as the quality of financial management in the institution.

Institutions are more complex financial organizations than is normally the case in business. On one hand, some activities are very similar to those in the commercial scene; residence halls, food service, and bookstores are primary examples. At the same time, academic institutions have a heavy investment in plant and a heavy investment in what might be considered support service: the library and the computer center. However, their basic mission is education and research. When all these divergent financial inputs are forced into a minimum number of financial indicators, we must proceed with great caution, carrying out thorough research and carefully testing the validity of the results.

On the positive side, we instinctively know that certain institutions such as Harvard (with more than a billion dollars in endowment) are financially healthier than are some small private institutions with no endowment. We know that a public institution that has received substantial state support over many years is in a stronger financial position than a similar institution with a history of minimal state support. Therefore, we must continue to develop new efforts in these areas, to be aware of the existing efforts, and to learn from each one of them how we may get better insight as to the health of institutions.

Eventually, we may need to recast how we present financial information. For example, we all know that institutions do not depreciate plant and yet at the same time we are becoming more and more aware that the plant is depreciating and that reserves are not being set aside. (As an aside, NACUBO's own fundamental concepts for financial accounting and reporting states as follows: "for purposes of statement presentation, depreciation allowance may be reported in the balance sheet and the provision for depreciation reported in the statement of changes in the balance of the Investment in Plant subgroup of the Plant Funds group.") Unfortunately,

over the last twenty years few college presidents have been willing to fund depreciation, and therefore it has seemed to be a useless exercise to consider. The discussion of depreciation is important because any financial indicators that do not make some allowance for the condition of the plant can provide only deceptive financial measures of the institution.

At present, NACUBO itself is engaged in a financial measure project, funded by the National Science Foundation, to develop a higher education research price index, building on work done in the past year which was based on the work of Kent Halstead. We hope that, as it develops, this project will help institutions to understand the impact of inflation on research costs and will prove useful in developing national policy for the support of research.

In summary, I do not have a design for a research program. Such a design should consider first the useful goals of the present research efforts, how to build on those efforts, and how to identify research needs in areas that are not now being given attention. Only after defining more sharply the useful goals can we successfully design research efforts to meet the priorities.